INTERIM REPORT
on
PERMISSIBLE LAND AND WATER USES
in the
MISSISSIPPI COASTAL ZONE

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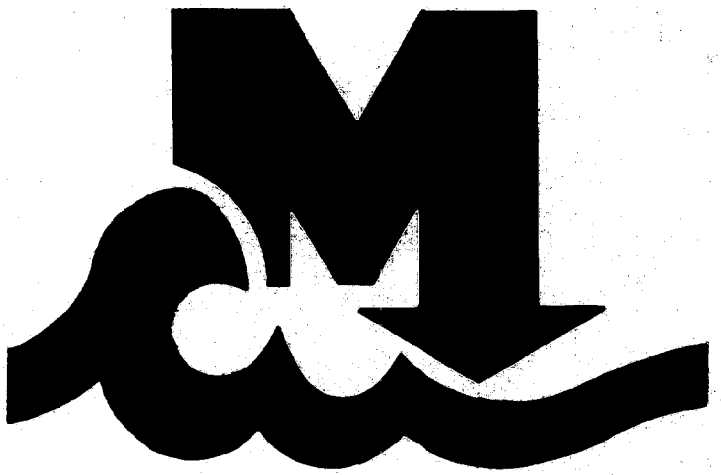

SSIPPI MARINE RESOURCES COUNCIL
COASTAL ZONE
INFORMATION CENTER

MMRC CZM Report 003

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on

PERMISSIBLE LAND AND WATER USES

in the

MISSISSIPPI COASTAL ZONE

D R A F T

Prepared by

Mississippi Marine Resources Council

April 1977

MMRC CZM Report 003

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ABSTRACT

The requirements of the Coastal Zone Management Act of 1972 specify, in part, that the State must develop an inventory of natural and man-made coastal resources, must establish a method for analysis of the various land and water uses and their impacts on the coastal waters, and must determine those uses which are subject to the program.

The Mississippi Marine Resources Council is developing a Mississippi Coastal Program under the provisions of the CZM Act and, as a part of this development process, has developed the required inventory, has established the required methodology, and has determined those land and water uses which are to be subject to the program. This work, like every phase of the development process, is subject to revision.

Although the boundary of the State's coastal zone has not as yet been delineated, the Council has concentrated its planning efforts first within the six southernmost counties of the state (Hancock, Harrison, Jackson, Pearl River, Stone and George), and more recently within the three coastal counties (Hancock, Harrison and Jackson).

The Council has prepared this interim report in draft form in order to assist the local, state and federal agencies and others who may be affected by the program. A revision of the material contained in this report will be included as a part of the draft Mississippi Coastal Program. The draft program will be subject to formal public hearings, action by the State Legislature and the Governor, and approval by the Department of Commerce before it can be implemented.

EXECUTIVE SUMMARY

Four of the seven elements which go into development of a Coastal Zone Management program relate to: (1) the boundary of the coastal zone, (2) specific areas within that boundary, (3) the manner in which these areas and their resources can be utilized, and (4) the method by which this utilization is regulated. There are numerous other aspects of a CZM program which will be embodied in the draft Mississippi Coastal Program, including a vast number of specific details, policies and regulations, but these are the basic parts of a working program.

The third of these four basic elements, the manner in which the coastal zone's resources may be used, directly addresses the primary objective of the CZM Act. It also is liable to result in the most controversy.

This report provides an extensive inventory of both natural and man-made resources of the coastal zone, including the historical and geological background of the area. The inventory goes into details of population, industrial and recreational facilities, transportation and other developments in Hancock, Harrison and Jackson counties.

The various land and water uses of these resources which can have direct and significant impact on the coastal waters, and thus are subject to the management program, are then defined and listed. Matrixes are included in the appendix listing these uses and evaluating them as to their significance, impact and the various support services and uses they would require.

An extensive methodology is then described for determining those land and water resource uses which are to be classified as permissible and subject to the program.

This methodology is to be applied to individual uses on a case-by-case basis for analysis. This methodology is shown in flow chart form in the appendix.

All of the material contained in this report is preliminary in nature and is published on an interim basis. It is being distributed to concerned individuals and agencies for comment prior to revision and inclusion as a part of the draft Mississippi Coastal Program. This program will be considered during formal public hearings prior to submission to the Legislature and Governor, and to the Department of Commerce, Office of Coastal Zone Management, for approval.

ACKNOWLEDGEMENTS

The Mississippi Marine Resources Council acknowledges the cooperation and assistance of Southern Mississippi Planning and Development District for technical and graphic assistance in the preparation of this report.

Acknowledgement is also extended to Gulf Regional Planning Commission for major portions of the Inventory of Natural and Man-made Coastal Resources.

Acknowledgement is also extended to Gulf Coast Research Laboratory for historical and geological sketches obtained from the Cooperative Gulf of Mexico Estuarine Inventory and Study--Mississippi.

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THE FOLLOWING GUIDE RELATES THE OCZM REQUIREMENTS FOR PROGRAM APPROVAL (SECTION 306) TO MISSISSIPPI'S COASTAL ZONE MANAGEMENT

REQUIREMENTS 15 CFR 923, SECTION		PART	PAGE
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DEFINITIONS

Coastal Waters	- those waters adjacent to the shorelines, including but not limited to - sounds, bays, bayous, and estuaries.
Coastal Wetlands	- as defined by the Mississippi Coastal Wetlands Protection Law, "means all publicly owned lands subject to the ebb and flow of the tide; which are below the watermark of ordinary high tide; all publicly owned accretions above the watermark of ordinary high tide. The term 'coastal wetlands' shall be interpreted to include the flora and fauna on the wetlands and in the wetlands."
Coastal Zone	- all those lands within the three Mississippi coastal counties of Hancock, Harrison and Jackson Counties including the Primary, Secondary and Tertiary Coastal Areas.
Direct and Significant Impact	- any activity initiated by man causing a discernible and/or predictable modification of the coastal wetlands. [All reasonable and appropriate uses having a direct and significant impact will be permitted if action is taken to protect against adverse effects to the economy, public health, the land and its vegetations and wildlife, and the waters within the coastal zone and their aquatic life.]

DEFINITIONS (CONTINUED)

Land Use - activities conducted on coastal lands above the watermark of ordinary high tide and abutting the state wetlands and includes activities which utilize and/or influence nearshore submerged lands of the coastal wetlands.

Permissible land and water uses - those uses that, by their very nature, are dependent to a coastal location adjacent to or on the state wetlands and have a direct and significant impact on coastal waters. [Such uses cause change in: Shoreline configurations, flow of littoral currents, bottom characteristics and other effects which influence, displace or result in loss of marine biota and/or with associated impact(s).]

Person - any natural person, partnership, joint stock company, corporate entity, unincorporated association or society, or the state and any agency thereof, or any county, municipality, or political subdivision, or any other corporation of any character whatsoever.

DEFINITIONS (CONTINUED)

Primary Coastal Area - all publicly owned lands subject to the ebb and flow of the tide which are below the watermark of ordinary high tide; all publicly owned accreations above the watermark of ordinary high tide; all publicly owned submerged water bottoms below the watermark of ordinary high tide and those areas between the natural banks of tidal influenced riverine systems.

Private - the facility or activity is not available to the public.

Public - any facility, activity or service that is available to all people on a "first come first serve" basis. Ownership may rest with a city, county, the state, an individual, or a corporation.

- when applied to transportation uses, is considered in the alternate sense of the term, that of being in general service to the community, region and nation.

Secondary Coastal Area - all upland areas, not owned or controlled by entities of the U.S. Government, which are between the watermark of ordinary high tide and the elevation of thirteen and one-tenth feet (13.5') above mean sea level, or those upland areas from the natural

Secondary Coastal Area (cont.) - banks of tidal influenced riverine systems up to the highest level of flooding that, on an average, is likely to occur once every one hundred (100) years or that has a one (1.0) percent chance of occurring each year.

Semi-Public - there are certain prerequisites that must be satisfied prior to use of a facility, such as ownership of a lot within a subdivision before a boat slip can be rented at the particular development's marina. However, the facility is available to all people who own land in the subdivision development.

Tertiary Coastal Area - all those lands within the coastal counties of Hancock, Harrison and Jackson.

Water Use - activities which are conducted on and/or in the coastal waters, and offshore facilities resting on, supported by or utilizing wetlands.

PART I

INTRODUCTION

INTRODUCTION

One of the national policies spelled out in the Coastal Zone Management Act is to assist the states in considering the ecological, cultural, historic and esthetic values of the coastal zone in addition to the needs for economic development.

All of the other elements of the Mississippi Coastal Program are simply a means of leading into direct consideration of these values and needs, the objective directly addressed in this interim report.

It is through the Mississippi Coastal Program that this state seeks to enable an orderly development of the rapidly growing coastal zone for the maximum benefit of this and future generations while insuring the future maintenance and utilization of the area's resources.

The Mississippi Marine Resources Council, through a series of contracts with other agencies and investigators in the past several years, has sought to identify those natural and man-made coastal resources in order to establish a framework for the coastal program. Several tests were applied to the various resource uses to determine what activities have a direct and significant impact on the coastal waters. Once these uses were determined and were analyzed by use of the methodology, those uses that met its test were determined to be subject to the program.

Other aspects of this task involved defining "direct and significant" impacts and a methodology for determining which uses have such an impact and, thus, are subject to the program.

The results of these efforts have been compiled by the Council and its staff into the element of the Mississippi Coastal Program known as Permissible Land and Water Uses.

PART II

INVENTORY OF NATURAL AND MAN-MADE COASTAL RESOURCES

REQUREMENTS OF THE CZM ACT

Section 923.12 (Title 15 CFR) requires that the management program shall include "an inventory of natural and man-made coastal resources."

PURPOSE

The first task in determining those uses which have a direct and significant impact on the coastal waters was to obtain information base concerning land use and population. This base included existing and projected trends in industry, commerce, recreation and transportation. These findings are presented in this part, along with supplementary information concerning late history of the coast, the geology and geography of the coastal area.

HISTORICAL SKETCHES

SIXTEENTH AND SEVENTEENTH CENTURY

Maps of this period offer the best means of following the progress of early discoveries in the Gulf of Mexico. A review of these early events is adequate from a Gulf-wide point of view.

Mississippi Sound was apparently first mapped as the "Mar Pequeña" of the 1519 expedition of Don Alonzo Alvarez de Pineda. Although some details including abundant oyster banks were noted, there remains some question as to whether Pineda actually reached what is now the Mississippi River and named it the "Rio del Espiritu Santu".

In 1528 the ill-fated expedition of Panfilo de Narvarez ended in the vicinity of Mississippi Sound. Cabeza de Vaca survived this expedition to make further explorations to the west. Although various explorers of several countries continued to add something to knowledge of the Mississippi Gulf Coast, permanent colonization did not begin until 1699.

SETTLEMENT TO STATEHOOD

Pierre le Moyne d'Iberville anchored his vessels at Ship Island on February 10, 1699. After explorations up the Mississippi and, by a part of this expedition, Lake Pontchartrain and Lake Maurepas, he placed a colony at "Vieux Biloxi". Although there is still some argument about the exact original location of Fort Maurepas, the first settlement, there now seems to be little question that it was first built in the Biloxi Bay area.

The area fell under the rule of France, England and Spain as they jockeyed for position in the New World. Final disposition occurred in 1810 when the United States by a show of force at Baton Rouge took over the West Florida area.

Seven years later representatives of coastal counties participated in the writing of the first Constitution of the State of Mississippi and admission to the Union was granted on December 10, 1817.

In 1818 the legislature authorized a lottery to raise additional money for the improvement of navigation channels in the Leaf, Chickasawhay and Pascagoula Rivers. These streams were major factors in the state's transportation. A 1966 condition report on Pascagoula River channel improvement, first authorized by Congress in 1899, shows the junction of the rivers at mile 81. Controlling depth to Dead Lake at mile 32 was 12 feet, with 3 feet to head of project. The Chickasawhay and Leaf, according to historical reports were navigable "almost any season of the year by vessels drawing not more than 5 feet" for distances of 130 and 60 miles, respectively. The Corps of Engineers in 1966 recommended abandonment of the maintenance authorization for Leaf and Chickasawhay rivers.

THE MISSISSIPPI GULF COAST

River transportation give way to the railroads about 1855. Prior to that time at least 1 million bales of cotton moved down the Pascagoula system from as far up river as Enterprise.

Mississippi briefly unfurled the Bonnie Blue flag and adopted the Magnolia flag before joining the Confederacy. Jefferson Davis spent his last days at Beauvoir.

Denudation of the virgin long leaf pine lands accelerated after The War Between the States. Demand for lumber grew and saw mills were established. World War I and the great depression that began with the stock market crash of 1929 had their effect. By the mid-1930s the last of the "inexhaustible" virgin timber was gone.

Fortunately for the watersheds of the Mississippi Coast the demand for pulpwood led to reforestation. The location of pulp mills on waterways and the resultant uncontrolled effluents was not so fortunate.

The ailing agrarian economy of the state was turned toward industry when Governor Hugh White initiated his "Balance Agriculture with Industry" program. Industrialization continues at a rapid pace.

Tourism got an early start in Coastal Mississippi. The haunting music of the Singing River, the mineral waters at Ocean Springs, the beautiful and bountiful estuarine waterways and the open-handed hospitality of the people contributed to the development of this industry.

Fishing was important to the development of the Mississippi Gulf Coast from the beginning. The fishing industry has often been overshadowed by others such as the lumber boom and shipbuilding. However, utilization of estuarine species in particular has been important and continuous.

The first shrimp cannery on the Mississippi coast was built in 1878 and was noted in (1887) the existence of "fishing establishments" on Horn Island.

From the founding of Biloxi in 1699, shellfish (shrimp and oysters) and fish afforded a way of life for the settlers. These marine animals not only served as a daily table staple, but were also used as barter for other essential items. Increased activity in the latter part of the nineteenth century accounted for considerable population increase from fishery workers who came and stayed. In 1901, one company alone shipped 525 carloads of shrimp and oysters.

Prior to and during United States participation in World War II expanding military bases and shipbuilding activities resulted in greatly increased human population density in coastal counties. Local and regional planning commissions have laid ambitious plans for industrialization of the entire coastal area.

For over two and one half centuries of occupation by "civilized" man and through undetermined thousands of years of Indian habitation, the coastal resources of Mississippi have been exploited. Remarkably, these resources have continued to renew themselves.

GEOLOGICAL SKETCHES

GENERAL DESCRIPTION

The Mississippi coast is classified as an "alluvial coast: terraced deltaic plain". The slope of the coastal plain is fairly steep, reaching eight feet per mile in some areas near the coast. The Pascagoula and Pearl Rivers flow through Pleistocene and Recent deltas. St. Louis Bay and Biloxi Bay are minor embayments of drowned stream valleys. A series of low, parallel, elevated shoreline scarps is evident. Relatively small drainage areas and the steep alluvial coast result in marsh areas that are in relation to the Louisiana coast, comparatively narrow.

Mississippi Sound is bounded offshore by a series of barrier islands with wide, shallow passes. Deeper water is found near the west end of the islands. Ship channels are maintained off the west end of Petit Bois and Ship Islands.

The Pascagoula and Pearl Rivers, with drainage areas of 9,400 and 8,700 square miles respectively have an average discharge into Mississippi Sound of 15,200 and 12,800 cfs (cubic feet per second) respectively. Biloxi River, Wolf River Jourdan River, Bayou Bernard and numerous smaller streams contribute to a total estimate of 19,660 sq. mi. of drainage area and an average discharge of 31,220 cfs. Additional fresh water enters the Sound from the Pontchartrain-Lake Borgne drainage and Mobile Bay.

The climate in the area is humid, warm-temperate to sub-tropical. Some freezing weather always occurs during the winter and occasional winters include periods of low temperature which result in surface ice on inland bays and bayous. Rainfall ranges from 34.5 to 90 inches per year, averaging 58.9.

In the Sound and adjacent waters many environmental factors vary areally and temporally. Annual variation as well as seasonal have been observed. Along the barrier islands, intertidal areas are almost entirely in sand. Fairly steep berms, bare of vegetation along the foreshore, characterize most of the beaches. On the mainland and inshore islands intertidal areas are more varied. Over one-third of the Mississippi Coast line has been "improved". Wide sand beaches have been built in front of seawalls by pumping material in from shallow waters offshore. Clays and silts soon leach out, leaving a clean sand surface. Constant maintenance prevents the growth of plants which, initially at least, start to cover recently filled areas. The nearshore bottom along these beaches varies from sand to sandy mud. The remaining natural beach at Belle Fontaine is several miles long and the bottom along this beach is usually softer.

Around the bays, distributaries and bayous there is usually a marsh border of variable width. Along the coast these marshes are made up of a typical Spartina-Juncus succession. Inland the species composition of the marsh flora changes with reduced salinity regimes.

Submerged vegetation along the coast is dominated by widgeon grass (Ruppia maritima). Species with lower salinity tolerances appear upstream. Around the barrier islands large beds are in evidence during the summer. In shallow water they die out during the winter. Beginning in shallow intertidal water and moving offshore the dominant species are shoal grass (Diplanthera wrightii), manatee grass (Cymodocea manatorum) and turtle grass (Thalassia testudinum).

The diurnal tides of Mississippi Sound have a predicted range of a little over 1.5 feet and a mean tide level of .8-.9 feet. However, the cyclic predictions are subject to drastic modifications by winds which are predominantly northerly and northeasterly during the winter months and southerly and southeasterly during the summer. Large areas of shallow flats are sometimes uncovered when winds are from the north. Prolonged periods of south and southeast winds sometimes keep the marshes flooded for long periods. These periods vary from year to year.

Soft mud sediments are found over most of the sub-tidal bottoms, except near the barrier islands. Solid substrate is generally limited to oyster reefs, scattered shell, other organic detritus and material introduced by man.

SHORELINE

It is approximately 70 statute miles along the Mississippi coast between east and west State lines. The tidal shoreline included in this distance is 369 statute miles. This distance comprises the shoreline of the barrier islands, the mainland

coast, and bays, rivers and creeks to the head of tidewater or to a point where tidal waters narrow to a width of 100 feet. Many additional miles of waterfront property lie along tidal streams and dredged channels above the point where they narrow to a width of 100 feet.

During the past several thousand years the shoreline of Mississippi has altered many times. Sea level has changed eustatically from about +20 feet to -350 feet in response to continental glaciation and melt. During the time of greatest glaciation sea level was perhaps 300-450 feet lower than the present, at which time existing streams entrenched themselves in deep, narrow valleys. Since then, sea level has risen erratically to its present level of still-stand, filling the valleys and inundating the lowlands. The Pascagoula River now represents a drowned river valley that is filling from its own load of sediments; Biloxi Bay is a drowned channel that has not yet filled. The lowlands were covered by a body of water, which, when modified by formation of barrier islands, became known as Mississippi Sound. Eustatic changes have not been apparent in the past 4000-5000 years, though the coastline has been modified by influx and deposition of sediments.

The presence of the Mississippi River delta affects the coastline of the western part of the state. The weight of sediments in the delta is causing a structural subsidence of the earth's crust between Texas and Alabama. In Mississippi there is a terrace level at +20 feet in Jackson County; in western Hancock County this terrace has disappeared beneath a sedimentary cover less than 10 feet in depth. Tectonic changes in local sea level are apparent in this feature as well as in the sinking of the western tip of Cat Island.

In summary, the coastline is termed as an "alluvial coast: of terraced deltaic plain" which is experienceing no eustatic sea level changes but is being altered by depositional and tectonic processes.

POPULATION AND LAND USE

Population estimates and projections were made for a general overview of the conditions in three county areas. These estimates and projections were made by the Gulf Regional Planning Commission (GRPC) under contract with the Mississippi Marine Resources Council. GRPC considered both population and housing concurrently in their projections since existing housing is one tool to estimate current population and, to the lesser extent, to forecast population growth. In making population forecasts, housing, as well as historic data, census information, and existing and proposed land use regulations, have been utilized.

EXISTANT POPULATION

Population in the study area experienced considerable growth during the period 1940 to 1970. As shown in Table 1, the region experienced a growth of 163 percent over the 30 year period while the State of Mississippi experienced less than 2 percent growth. The largest individual growth was seen in Jackson County where population increased by 327 percent.

It is obvious from these facts that the coastal area, particularly Harrison and Jackson Counties is growing at a rapid rate. Because of this, special attention must be given the area in providing services and meeting growing socio-economic demands brought on by these increases.

TABLE 1
POPULATION GROWTH PATTERNS
1940 to 1970

AREA	Population 1940	1950	1960	1970	Percent change 1940 to 1970
Hancock Co.	11,328	11,891	14,039	17,387	53
Harrison Co.	50,799	84,073	119,489	134,582	165
Jackson Co.	20,601	31,401	55,522	87,975	327
Region 11	101,853	148,006	211,461	267,746	163
State	2,183,796	2,178,914	2,178,141	2,216,912	2

1 Includes Hancock, Harrison, Jackson and Pearl River Counties

SOURCE: GRPC," 1973 Housing Program" based on Census Data for the years 1940, 1950, 1960, and 1970.

PROJECTED POPULATION

Population estimates at 5 year intervals (Table 2) have been computed for each municipality in the Coast counties in order to address socio-economic demands where they are most frequently found. Countywide estimates and forecasts to the year 2000 are shown on Table 3.

TABLE 2
MUNICIPAL POPULATION
FIVE YEAR INTERVALS
1975 through 2000
Gulf Region

Municipality						
HANCOCK COUNTY						
Bay St. Louis	6,854	7,654	8,454	9,254	10,054	10,899
Waveland	4,614	4,979	5,344	5,709	6,074	6,438
HARRISON COUNTY						
Pass Christian	7,149	7,828	8,507	9,208	9,908	10,488
Long Beach	9,239	9,353	9,467	10,252	11,037	12,204
Gulfport 1/	52,291	54,081	55,870	60,557	65,243	68,156
Biloxi 1/	43,025	49,387	55,749	61,295	66,840	72,471
JACKSON COUNTY						
Ocean Springs	14,170	15,078	15,985	17,771	19,557	20,357
Moss Point	20,008	23,986	27,964	31,091	34,218	37,362
Pascagoula	33,874	36,251	38,628	42,949	47,271	51,566

1/ Figures for Gulfport & Biloxi do not include population residing in on-base housing at Keesler Air Force Base & the Naval Construction Battalion Center.

SOURCE: Existing Population figures are based on current housing accommodations. Forecasted populations are straight line projections based on historical data. Gulf Regional Planning Commission

TABLE 3
COUNTYWIDE POPULATION ESTIMATES
EXISTING & FORECASTED

County	Population 1975	Population 2000
HANCOCK		
Total County	20,481	54,339
Total Unincorporated	9,013	37,002
Total Municipal	11,468	17,337
Bay St. Louis	6,854	10,899
Waveland	4,614	6,438
HARRISON		
Total County	163,155	242,305
Total Unincorporated	51,451	78,986
Total Municipal	111,704	163,319
Pass Christian	7,149	10,488
Long Beach	9,239	12,204
Gulfport	52,291	68,156
Biloxi	43,025	72,471
JACKSON		
Total County	115,636	189,751
Total Unincorporated	47,584	80,466
Total Municipal	68,052	109,285
Ocean Springs	14,170	20,357
Moss Point	20,008	37,362
Pascagoula	33,874	51,566
COASTAL REGION		
Total Region	299,991	476,446
Total Unincorporated	108,767	186,505
Total Municipal	191,224	289,441

SOURCE - Gulf Regional Planning Commission

LAND USE

Land use in the three county coast area are broadly grouped into eight classifications. Each classification and sub-classification were delineated on individual township maps of the three counties. These maps are not shown in this report since they go beyond the general purpose of this study. Copies of the maps may be viewed at the offices of the Mississippi Marine Resources Council.

The eight land use classifications are as follows:

1. Residential contains five sub-categories; single family, mobile home, duplex, multi-family and mobile home parks.

2. Commercial, covering all types of commercial activity including central business districts, neighborhood commercial, community and regional shopping centers and general highway commercial.

3. Industrial classifications embrace all existing industries including all forms of manufacturing, open storage of raw materials, semi-finished and finished products, salvage yards and excavation activities.

4. Public and semi-public land uses cover all governmental activities including schools, colleges, fire stations, courthouses, city halls, libraries, and tax supported institutions, churches, non-profit hospitals, community centers, public recreation, parks, stadiums, public beaches and similar uses.

5. Rights-of-way identify lands delineated for streets, roads, highways, railroads, and utility lines.

6. Resource production activities include all types of farming, crops, pastures, dairies, orchards, commercial forests, national forests and tidal marshes.

7. NASA-Military lands include the National Space Technologies Laboratory, Keesler Air Force Base and the Naval Construction Battalion Center (NCBC).

8. Water and Unclassified make up the remainder of land uses within this classification. These areas are usually left void of any classification and may be generally identified by lack of activity.

Land use surveys conducted by Gulf Regional Planning Commission in 1969 and 1972 serve as a basis for determining trends in land use activities. In the following paragraphs each county is addressed separately relative to land use changes between the year 1969 and 1972. Such comparisons may be used to analyze current activities and to plan future land uses within the study area. A summary of existing land use acreage and changes is given in Table 4.

Some short observations are also made as to the cause of the change in the various land uses.

HANCOCK COUNTY

Hancock County has two incoporated cities within its boundaries, Bay St. Louis and Waveland, both having comprehensive community plans by which growth may be guided. Between 1969 and 1974, Bay St. Louis updated its zoning regulations while Waveland adopted a completely new zoning ordinance. Hancock County has adopted subdivision regulations.

The County's economy is directly linked with tourism but the degree in linkage is uncertain. With the opening of Interstate 10 during 1973, the urban areas (Bay St. Louis and Waveland) were by-passed by this major thoroughfare. The extent of economic consequences is undetermined at this time; however, an I-10 Impact Study conducted by GRPC in 1973 predicted minimum long term adverse impact.

TABLE 4

EXISTING LAND USE SUMMARIES

With Percent Changes from 1969 - 1972

County	Residential Acreage	%Change	Commercial Acreage	%Change	Industrial Acreage	%Change	Public, Semi-Public Acreage	%Change	Rights-of-Way Acreage	%Change	Resource Production Acreage	%Change	NASA Military Acreage	%Change	Water and Unclassified Acreage	%Change	Total Acreage
Hancock	3,865.9	47	231.6	18	4,442.6	1	1,480.3	95	6,835.8	4	59,018.1	50	109,820.7	0	122,165.6	-15	307,410.6
Harrison	14,239.3	18	1,434.2	13	2,389.3	15	5,366.6	0	10,193.4	3	187,449.3	3	2,802.1	0	155,467.4	- 4	379,341.6
Jackson	11,403.3	17	938.7	13	5,181.8	8	6,401.3	3	10,407.2	3	178,230.4	20	00.0	0	253.325.1	-10	465,887.8
REGION[1]	34,800.3	--	2,892.8	--	12,665.2	--	15,910.2	--	36,782.5	--	677,032.1	--	115,301.1	-	777,750.5	--	1,673,134.5

1 Includes Hancock, Harrison, Jackson and Pearl River Counties.

SOURCE: GRPC - Regional Land Use Plan, 1973.

Initial data for Hancock County was collected in 1969 while data for updating purposes was accumulated in 1972. A comparative analysis of these data revealed some interesting findings that are discussed below.

Residential land use showed an over-all increase of 47% from 1969 to 1972. An increase of this magnitude could possibly have had an undesirable effect on the County as a whole, due to the overloading of existing public facilities, such as streets, sewage, water systems, policy and fire departments, schools and libraries. Fortunately, deficiencies have not been too severe, although sewage collection and water systems constituted somewhat significant problems. More recently efforts have been made to alleviate these deficiencies, the results of which are found in a new treatment plant for Waveland and experiments with new treatment concepts in the form of water hyacinths in Bay St. Louis. At present, Hancock County is utilizing only 19% of the total residential acreage that will be needed by 2000.

Commercial acreage showed an over-all gain of 18% from 1969 to 1972. The increase was necessary to adequately provide goods and services for the large residential influx.

Industrial land use increased only slightly over the past three years; nevertheless, a great amount of progress was accomplished in this category. Considerable development occurred at the Industrial Park and Seaway (Port Bienville) located south of Pearlington near the mouth of Pearl River. By means of this development, Hancock County, under the direction of the Port and Harbor Commission, is attempting to further diversify the County's economic base. Industrial development also occurred at Stennis International Airport which is located adjacent to the eastern boundary of the NSTL Buffer Zone, (NASA).

Public and Semi-Public acreage grew enormously over the period of analysis (1969-1972). Actual increase of this category was almost 100%. Two facilities were primarily responsible for this increase. First with the addition of Stennis International Airport which was not considered in the initial (1969) survey since the facility was not then in operation. The other major addition came with the donation of several hundred acres as a Boy Scout Camp which is placed in the Semi-Public category. The Boy Scout facility is now completed and includes a large lake providing additional recreational activities. These facilities, combined with the construction of Buccaneer State Park in Waveland, constitute three very substantial assets for Hancock County.

Resource Production land use reflected an increase of 50% from 1969 to 1972. The actual increase was a result of Tidal Marsh becoming a protected resource, thus allowing tidelands to be placed in Resource Production. Agricultural and orchard acres remained stable with very little variation demonstrated in survey statistics.

Water and Unclassified decreased by 15% with several areas revealing a decrease of over 30%. Primary responsibility for the dramatic loss is due to the removal of Tidal Marsh from this category. Unclassified areas sustained the loss with water remaining the same.

HARRISON COUNTY

As stated previously, base figures for Harrison County were obtained in 1969 with later statistics being accumulated in 1972. Harrison County has four incorporated cities; Biloxi, Gulfport, Long Beach, and Pass Christian, accounting for a major portion of the County's urban area. A comparison of base figures with present computations revealed no extraordinary trends (see Table 4). The county, while appearing to be economically diversified, is at present highly dependent on military activities.

Residential acreage showed an overall increase of 18% from 1969 to 1972 with the urban area showing the greatest increase (22%). This growth was considered healthy and in accordance with the regional plan. Rural residential acreage increased significantly due to the increase of non-farm residences and the influx of mobile home dwellers.

Commercial acreage increased 13% through the County with a 9% gain in the urban area and a 29% gain in the rural area in the past three years (See Table 5). Commercial acreage increased at a faster rate than anticipated in the land use plan, particularly in the rural area.

TABLE 5
HARRISON COUNTY
RESIDENTIAL-COMMERCIAL ANALYSIS

URBAN (incorporated area)	No. of Acres 1969	No. of Acres 1972	Percent Increase
Residential	6,500.16	7,907.55	22
Commercial	997.73	1,084.50	9
RURAL (unincorporated area)			
Residential	5,564.94	6,331.78	14
Commercial	270.88	349.71	29

Industrial land use rose substantially in three years (15%). The main addition came with the development of the Long Beach Industrial Park.

Public and Semi-Public land use show no appreciable increase; however, this does not indicate a lack of constructive activity in the category. New parks were constructed and others received much needed restoration efforts. Other public and semi-public activities involve plans for construction of the Coast Coliseum on Highway 90 in Biloxi and a new County Courthouse in Gulfport.

Resource Production acreage increased by 3%. This figure is substantial when the amount of acres involved is considered, amounting to an actual increase of more than 5,000 acres. The tremendous increase is attributable to the addition of Tidal Marsh. Tide lands or those lands below ordinary mean high tide are now protected and regulated under 1973 state legislative action. Commercial and National forests remained constant with no noticable variance in the land use.

Water and Unclassified areas decreased 4% primarily because of tidal marsh being reclassified and placed in Resource Production. As other land uses expand, unclassified areas will obviously decrease. The rate of decrease will be rapid as all unclassified lands are programmed to be integrated with productive land uses, as illustrated by tidal marsh being reclassified as Resource Production.

JACKSON COUNTY

Jackson County was the first County in the Region to adopt a County-wide zoning ordinance and subdivision regulations. Each of the three cities, Moss Point, Ocean Springs, and Pascagoula, have comprehensive plans and corresponding zoning ordinances. Early action in land use controls has already made it possible to anticipate and avert potential problems.

Survey data obtained in 1969 and again in 1972 revealed, as suspected, that Jackson County is growing rapidly in most areas. However, monitoring of certain indicators revealed that accelerated growth has probably reached its peak and is now continuing at a more normal rate.

Residential land use had a tremendous increase of 44% between 1969 and 1972. Survey findings also revealed a 30% increase in the total number of dwelling units within the same period. One explanation for a larger increase in residential acreage than in number of dwelling units is that a greater number of homes were being built in the County where lot sizes tend to be larger than within the cities. The County economy has expanded rapidly and in an effort to keep up with this expansion, developers have worked vigorously to provide a supply of residential property adequate to meet current demands.

Commercial land uses showed an increase of approximately 13 percent. This increase was essential in order to supply the rapid residential growth with goods and services. Even with comprehensive zoning to regulate and guide commercial expansion, portions of this increase are seen as "strip commercialism" resulting

from the continuing development of commercial property along U. S. Highway 90 between the cities of Ocean Springs and Pascagoula.

Industrial land use increased by 8% as the County continued to broaden its economic base. To the already existing industrial areas around Bayou Casotte, Moss Point and Ingalls shipyards, other plans were developed for additional industrial acreage.

Public and Semi-Public land use was 3% over the previous survey computations of 1969. The creation of the Gulf Islands National Seashore Park, although not appreciably increasing land area, was a monumental change. The on shore operations for the National Park was formerly the Magnolia State Park located adjacent to Ocean Springs and bordering the Mississippi Sound. Other areas where increases occurred were in public utilities and services.

Resource Production remained a stable land use with the exception of the addition of Tidal Marsh which amounted to over twenty-seven thousand acres (20%), emphasizing the timeliness of recent state legislation to preserve coastal wetlands in the region.

Water and Unclassified areas had an over-all decrease of 9%, with the largest loss attributed to the removal of Tidal Marsh from this category. Increased residential land use also accounted for a protion of the decrease. The reduction of acreage in this land use was not unexpected, but predicted, in order to remain consistent with the Regional Land Use Plan. Unclassified areas incurred the decrease, while water areas remained virtually the same.

OFFSHORE ISLANDS

There are six islands located in Mississippi Sound which must be given consideration in light of the purpose of this project, Petit Bois, Horn, Round,

Deer, Ship and Cat Islands. Of these islands only Deer Island was placed in the existing and future land use computations, due to its proximity to the mainland and the City of Biloxi.

Petit Bois, Horn, and Ship Islands have been placed in the National Park system by congressional action; these islands are now part of the Gulf Islands National Seashore. Plans are being prepared now to develop the islands for recreational purposes including overnight camping, fishing, swimming and related activities, with visits to Ship Island and historic Fort Massachusetts.

Round Island, one of the smaller and less significant islands, serves as an ideal area to be preserved in its natural state.

Cat Island, though privately owned, has seen limited development in recent years. The area has been subdivided into lots for summer home dwellings and includes a series of dredged canals for residential docking facilities.

SIGNIFICANT MAN-MADE COASTAL RESOURCES

TRANSPORTATION

Transportation within the study area involves a series of networks and systems that occupy approximately 36,600 acres of land excluding those requirements of airports.

STREETS AND HIGHWAYS

A Gulf Coast Area Transportation Plan developed for the GRPC in 1971 identified and classified each transportation route within the urban area. Also included were projections and roadway classifications which would be needed to meet future demands.

Major roadways are defined categorically as they relate to areas they serve. Collectors move traffic within communities. They tie in with arterials which transfer traffic over larger areas and between communities. These in turn may connect with freeways, interstates or expressways. Freeways, interstates and expressways are controlled access routes designed to move larger volumes of traffic at maximum speeds.

AIRPORTS

The three county study area is comprised of three distinct types of airport facilities: Air Carrier Facilities, General Aviation Facilities and Military Installations. This grouping is necessary and significant in terms of the traffic levels handled by such installations, by the types of aircraft which make use of these various airfields, by the runway, airspace and terminal requirements, and by the degree and type of interaction with other fields in the area.

The air carrier airports are located to serve large concentrations of population and/or commerce, mainly because that is where the demand for their services exist. They require runways of considerable length, width, and some type of instrumentation and lighting, as well as passenger terminal and/or cargo handling facilities, and adequate ground access. These facilities do, however, accommodate and encourage operations by general aviation aircraft. Presently only the facility at Gulfport, serving most of the coastal area falls into this category.

General aviation airports may and frequently do serve smaller population centers or industrial or recreational areas. These airports generally require less runway width, length and strength. Some have runway lighting and a published VOR or ADF approach. Such airports are owned and operated by municipalities as well as private individuals. Those in the study area which fall into this group include the Stennis International Airport, Diamondhead Airport in Hancock County, the Gulf Park Facility east of Ocean Springs and the Jackson County Airport. Within the general aviation grouping, one must further distinguish between "public" and "private" use airports. The former (of interest in this study) serve aviation by offering services, charter, rental, instruction, etc. to the public. The latter are relatively few in number in the Gulf Coast Region and do not offer service to the public. Although patronage of the public is not solicited by private fields, they are available to any aircraft in case of emergency.

Finally, military installations must be considered in relation to operations of military flight missions within the study area. Here only Keesler Air Force Base need be considered.

RAILROADS

Within the three counties there are three railroads, the Louisville and Nashville, Illinois Central Gulf and the Mississippi Export.

The Louisville and Nashville generally follow the coastline east and west connecting the coastal municipalities with New Orleans and Mobile and all connecting points.

The Illinois Central Gulf which is located in Harrison County (Gulfport) and extends northward to Hattiesburg, Jackson areas.

The Mississippi Export railroad serves the Jackson County area connecting Pascagoula and Moss Point with Lucedale in Stone County and interconnecting with the Gulf Mobile and Ohio Railroad near Lucedale.

A general increase in rail passenger service in the area is not anticipated. However, efforts being sponsored by the Mississippi Coast Transportation Authority and other interested groups are currently underway to determine the feasibility of establishing passenger service between Ingalls Shipbuilding facility and strategic points along the Coast.

CHANNELS

Navigation channels maintained by the U.S. Army Corps of Engineers provide access to and through all of the major bays and harbors in coastal Mississippi. Most of these are of long standing with existing authorized projects dating back to 1890. Continuing maintenance is required in nearly all channels. The resultant spoil banks have changed the circulation in some areas of the Sound. Although some of the original construction was accomplished by private interests, the Corps of Engineers has accepted responsibility for their maintenance.

Long range master plans for industrial development have been prepared by agencies in each of the coastal counties. These plans call for extensive dredging and filling to produce waterfront industrial sites. Most of these plans locate access channels and expansion in or near existing navigation channels.

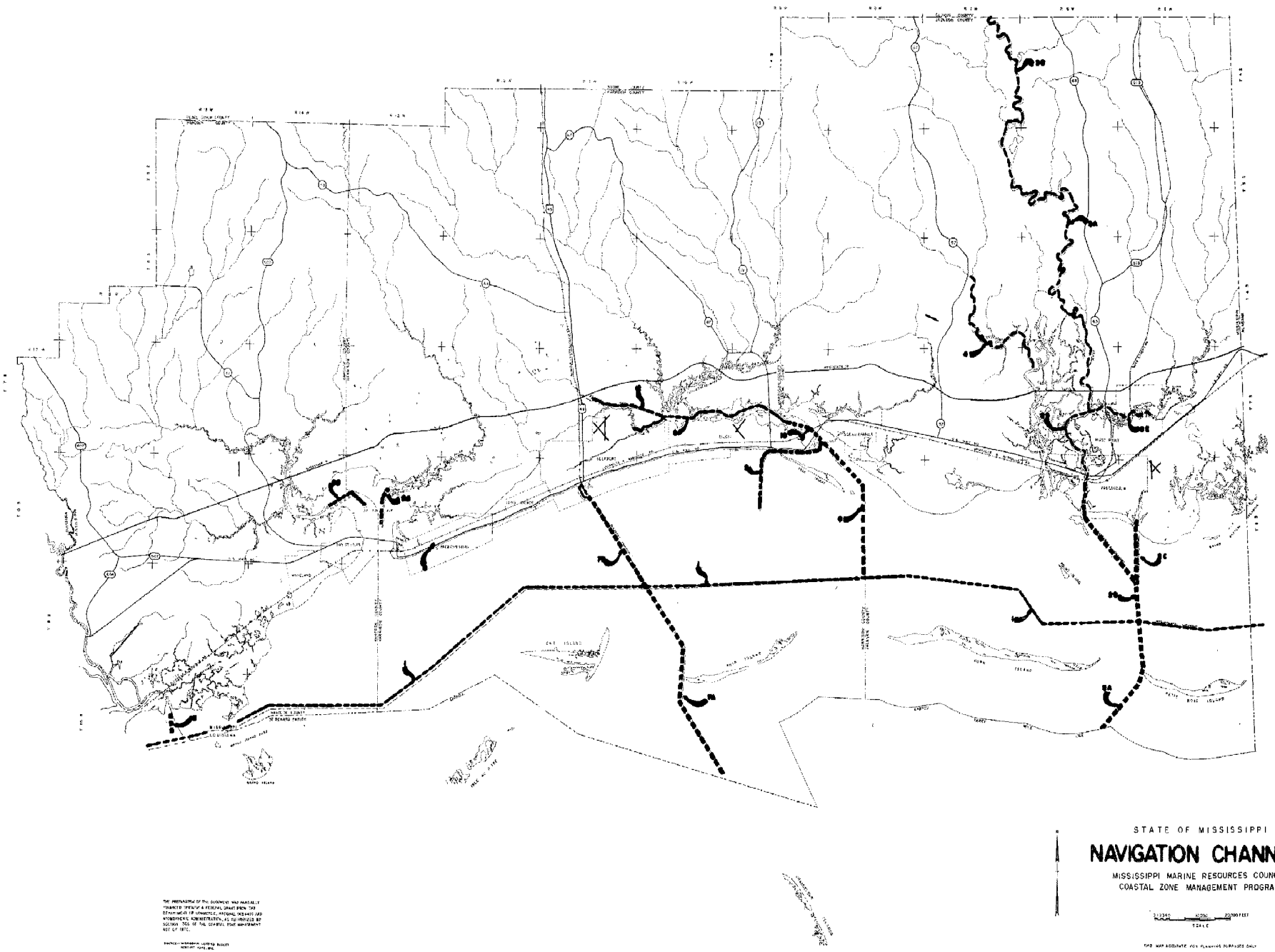
Table 6 and Map 1 show the location and some dimensions of existing channels. Unless otherwise indicated, most of the data in the following discussions are taken from 1966 project maps and data sheets furnished by the Mobile District, U. S. Army Corps of Engineers.

GULF INTRACOASTAL WATERWAY

The Gulf intracoastal waterway provides a protected channel 12 feet deep and 150 feet wide along the entire coastline of the State of Mississippi.

Tremendous traffic demands of World War II resulted in an authorization in 1942 to enlarge the channel to its present dimensions. The work was completed in 1943. The waterway links all ports along the Mississippi Gulf Coast with inland waterway systems emptying into the Gulf of Mexico.

Maintenance dredging is required only in the Pass Marianne-Grand Island sections of the channel in the west end of the Sound. Spoil areas are located south of the Grand Island Channel near the Mississippi-Louisiana state line.



STATE OF MISSISSIPPI

NAVIGATION CHANNELS

MISSISSIPPI MARINE RESOURCES COUNCIL
COASTAL ZONE MANAGEMENT PROGRAM

SCALE

THIS MAP ACCURATE FOR PLANNING PURPOSES ONLY

THE PREPARATION OF THIS DOCUMENT WAS PARTIALLY FINANCED THROUGH A FEDERAL GRANT FROM THE DEPARTMENT OF COMMERCE, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, AS AUTHORIZED BY SECTION 306 OF THE COASTAL ZONE MANAGEMENT ACT OF 1972.

TABLE 6 NAVIGATION CHANNELS
IN THE MISSISSIPPI SOUND

MAP CODE	NAME	L	W	D	S
1	Gulf Intra-coastal Waterway, Mississippi Sound	75.0	150	12	A
2	Pascagoula Harbor				
	A. Entrance Channel, west end of Petit Bois Island	2.0	350	40	A
	B. Pascagoula Ship Channel, Horn Island Pass to Pascagoula	12.0	350	38	A
	C. Bayou Cassotte Channel, mile 7 on Pascagoula Channel to Bayou Cassotte, including harbor	4.4	225	38	A
	D. Pascagoula River-Escatawpa Channel, Pascagoula to Highway 63 Bridge on Escatawpa	6.0	125	22	A
	E. Escatawpa River, Highway 63 Bridge to mile 6	4.0	125	12	A
3	Pascagoula River				
	A. Mouth to Escatawpa to Dead Lake	27.0	-	12	B
	B. Dead Lake to Merrill	47.0	-	3	B
4	Bluff Creek Mouth of creek on West Pascagoula River to Vancleave	10.0	-	7	B
5	Biloxi Harbor, Mississippi Sound West of Deer Island to Bayou Bernard	23.0	150	12	A
6	Harrison Industrial Seaway, Biloxi Bay East of Deer Island to Intracoastal Waterway	11.9	150	12	A
7	Gulfport Harbor				
	A. Ship Island Bar Channel, west end of Ship Island	8.0	300	32	A
	B. Gulfport Ship Channel, Ship Island to Gulfport Harbor	11.0	220	30	A
8	Pass Christian Harbor, 7-foot isobath in Mississippi Sound to Harbor	-	100	7	A
9	Wolf And Jourdan Rivers				
	A. Wolf River, St. Louis Bay to Wolf River	1.6	100	6.5	A
	B. Jourdan River, St. Louis Bay to Jourdan River	2.0	100	7.0	A
10	Ott Bayou east and west access channel	1.0	150	12	A
11	East Pearl River, River entrance	1.3	200	8.3	A
12	Industrial Seaway, Back Bay Biloxi to Bayou Bernard	5	150	12	A

LEGEND
L-Length in statute miles, W-Width, D-Depth in feet, S-State of Completion (A-Completed, B-Maintenance Only, C-Authorized, D-Proposed)

SOURCE
Corps of Engineers

PASCAGOULA HARBOR

The Pascagoula Harbor is located along the lower 6.8 mi. of the Pascagoula River the lower 6 mi. of Escatawpa (Dog) River, and on Bayou Casotte. The project provided for: (a) an entrance channel 40 ft. deep and 350 ft. wide from the Gulf of Mexico through Horn Island Pass, including an impounding area for littoral drift 40 ft. deep, 200 ft. wide and about 1,500 ft. long adjacent to the channel at the west end of Petit Bois Island; (b) a channel 38 ft. deep and 350 ft. wide in Mississippi Sound and Pascagoula River to the railroad bridge at Pascagoula including a turning basin, 2,000 ft. long and 950 ft. wide (including channel area) on the west side of the river below the railroad bridge; (c) a channel 38 ft. deep and 225 ft. wide from the ship channel in Mississippi Sound to the mouth of Bayou Cassotte, thence 38 ft. deep and 300 ft. wide for about 1 mi. to a turning basin 38 ft. deep, 1,000 ft. wide and 1,750 ft. long; (d) a 22 x 150 ft. channel up the Pascagoula River from the railroad bridge to the mouth of Dog River, thence up Dog River to Highway 63 bridge; and (e) a 12 x 125-ft. channel from the highway bridge, via Robertson and Bounds Lakes, to mile 6 on Dog River. The length of all the Channels in this project is about 28 mi. (U.S. Army Corps of Engineers 1965).

Expansion of the Pascagoula harbor has been accomplished by the State of Mississippi by dredging a deep water channel and harbor west of the Pascagoula Channel at the mouth of the River. This facility was built to accommodate Litton Industries' "shipyard of the future".

Spoil banks are located along the west side of the channel from the mouth of the river to Petit Bois Island, disrupting the westerly flow in the sound. All east-west traffic between Spanish Point at the mouth of the river and the Intracoastal Waterway is required to find a designated channel through the spoil banks. Numerous islands have been built up in the spoil area. Similar conditions have been developed on the east side of the Bayou Casotte section of the project.

PASCAGOULA RIVER

The existing Pascagoula River navigation project provides for maintenance of the channel above the mouth of Escatawpa (Dog) River to mile 81 at the junction of the Leaf and Chickasawhay rivers. In recent years, maintenance has been spasmodic because of reduced traffic.

BLUFF CREEK

The current Bluff Creek project was authorized in 1890. It provides for the removal of obstructions from the mouth of the creek on West Pascagoula River to Vancleave, a distance of about 10 miles. With the decrease in logging operations along the stream, abandoment was recommended. However, a small industry was developed near Vancleave and maintenance was resumed in 1958.

BILOXI HARBOR

The first project for Biloxi Harbor was adopted in 1882. The present project provides for a continuous channel about 23 miles long, 12 feet deep and 150 feet wide from the Mississippi Sound passing west of Deer Island to the 12-feet depth in Back Bay, thence 12 feet deep and 100 feet wide in Back Bay, Cranes Neck and Bayou Bernard to the Air Force Terminal about mile 2.6.

Maintenance of the East Access Channel through Biloxi Bay and across Mississippi Sound east of Deer Island to the Intra-coastal Waterway (constructed by state funds) has been accepted by the Corps of Engineers. Deepening and widening of the channel to accommodate ships is provided for in the plans.

Spoil areas are located south and west of the Industrial Waterway in Biloxi Bay and Mississippi Sound. In the Biloxi Harbor entrance channel west of Deer Island, spoil is pumped to the east and deposited off the west end of Deer Island. Continuing maintenance is required in Bay and Sound channels. Some spoil areas in the Bay have been built up above the water surface.

GULFPORT HARBOR

The Gulfport Harbor Project was first adopted in 1899. The present authority for channels 32 ft. deep and 300 ft. wide across Ship Island Bar and 220 ft. wide by 30 ft. deep across Mississippi Sound. The Gulfport anchorage basin is 30 ft. deep, 1,320 ft. wide and 2,640 ft. long. An 8-ft. channel is maintained into the 26-acre commercial small craft harbor west of the anchorage basin.

Spoil areas, with provision for maintenance of the Intracoastal Waterway where it crosses the Gulfport Channel, extend across the Sound on both sides of the Channel.

PASS CHRISTIAN HARBOR

The Pass Christian Harbor, 1,000 ft. long and 700 ft. wide, is provided with an entrance channel to the 7-ft. contour in Mississippi Sound. There is a small spoil area along the beach west of the harbor.

WOLF AND JOURDAN RIVERS

The Wolf and Jourdan River Channels were completed in 1908. Channels extend from the 6-ft. contour in St. Louis Bay to the 7-ft. contour in each stream.

Spoil areas extend along the Bay side of each channel.

EAST PEARL RIVER

A dredged channel 9 ft. deep provides access to the mouth of East Pearl River at the Mississippi-Louisiana state line.

PEARL RIVER

A navigation channel from the mouth of West Pearl River in Louisiana to Bogalusa, Louisiana was authorized in 1935. It was completed in 1953. A lateral canal from the mouth of Holmes Bayou to Pool's Bluff provides three locks.

HANCOCK COUNTY DEEP WATER ACCESS

Long-range plans of the Hancock County Port and Harbor Commission include a ship channel from the Gulf of Mexico south of Ship Island to harbors and industrial sites in Hancock County. These plans include a 150- by 12-ft. access channel into St. Louis Bay. Construction of shallow draft channels and harbor in southwest Hancock County with state funds is well advanced.

Spoil areas for the proposed channel extend along the south side.

BAYOU PORTAGE

The Bayou Portage Channel, constructed and maintained by local interests, provides an 8- by 100-ft. channel from St. Louis Bay to the Pass Christian industrial area. Spoil areas are located in St. Louis Bay.

OTHER

There are many miles of dredged channel connecting private property to natural waterways in all areas of the Gulf Coast. These channels have been cut through marshes and natural channels, in most cases for the purpose of producing water-front property in housing project areas.

INTERIOR NAVIGATION

Ocean transportation routes, though not specifically identified, provide access to the two major commercial harbors previously mentioned. Interior navigation routes must be given special attention, however, because of their ability to provide access to an unlimited number of inland destinations.

Mississippi State Laws define navigable streams as follows:

> All rivers, creeks and bayous in this state, twenty-five miles in length that have sufficient depth and width of water for thirty

> consecutive days in the year for floating a steamboat with carrying capacity of two hundred bales of cotton....(Mississippi Code 1972 51-1-1.)

While it appears that this definition is somewhat antiquated, it is in keeping with navigable limits as defined for the purpose of this report. Navigable limits as referred to herein mean those points on major streams beyond which it is hazardous for commercial fishing boats or industrial barges to proceed.

ELECTRICAL ENERGY GENERATION

Parts of the following information were prepared by the Mississippi Power Company at the request of Gulf Regional Planning Commission. For this report only those facilities within the three coastal counties were addressed and limited to the basic facilities.

DESCRIPTION OF EXISTING POWER COMPANY GENERATING FACILITIES

At Plant Jack Watson, located near Gulfport and Biloxi, there are two 75,000 kilowatt units, one 112,000 kilowatt unit, one 250,000 kilowatt unit, and one 500,000 kilowatt unit, all of which are steam electric turbin generators, and one 39,360 kilowatt combustion turbin in service.

Primary and alternate fuels used in the Company's generating stations vary in the different plants. At Plant Jack Watson the two 75,000 kilowatt units and the one 112,000 kilowatt steam units and the 39,360 kilowatt combustion turbine utilize gas as the primary fuel and No. 2 oil as the alternate fuel. The 250,000 kilowatt unit uses coals as the primary fuel with natural gas as the alternate fuel and the 500,000 kilowatt unit uses coal as its fuel with no alternate provided. Natural gas at this location is being increasingly curtailed by the supplier.

PLANNED NEW GENERATING FACILITIES

The Mississippi Power Company has underway the construction of two new 500 MW steam-electric generating units stationed in Jackson County. The Company's designation of the initial units is Jackson County Steam Plant - Unit No. 1 and Unit No. 2.

The site is located approximately 11 to 12 miles north of the city of Pascagoula and lies on the east bank of the Pascagoula River. The site encompasses approximately 3000 acres.

Site investigation and clearing was initiated in 1972 and construction of the facilities began in 1973. Construction is scheduled for completion of Unit No. 1 in 1977, and completion of Unit No. 2 is scheduled for 1979.

For the operation of the plant, average monthly water balance studies indicate that 11.45 MGD of make-up water for the closed cooling system will be withdrawn from the Pascagoula River. This make-up will be needed in addition to the water added by rainfall and water shed to equate the losses due to evaporation and seepage.

The ultimate plant site generating capacity would require an estimated withdrawal rate from the Pascagoula River of 74.55 MGD of which 14 MDG will be returned.

The boilers will be arranged to have the capability of being fired with either fuel oil until late 1978, after which coal would become the primary fuel. Unit No. 2 is expected to use coal as the primary fuel when it begins operation in early or mid 1979.

SIGNIFICANT NATURAL COASTAL RESOURCES

Significant natural resources are generally identified as beaches, barrier islands, wetlands, certain upland areas, coastal waters, natural harbors and sand dunes.

To meet the requirements of other portions of the Coastal Zone Management Act, a major portion of these natural areas have been identified.

Listed in the draft Interim Report on Geographic Areas of Particular Concern Priority of Uses and Areas for Preservation and Restoration in the Mississippi Coastal Zone, MMRC Report CZM 002, were twenty-six areas of concern. Of these twenty-six areas, eleven of the areas could, without debate be classed as "significant natural areas."

The eleven geographic areas of concern categories that fall within the natural coastal resource classification are:

(1) Coastal Wetlands and Estuaries
(2) Freshwater Swamps and Marshes
(3) Surface Waters
(4) Natural Rivers
(5) Significant Beaches
(6) Mineral Resource Areas
(7) Shellfish Habitats
(8) Saltwater Fish Habitats
(9) Freshwater Fish Habitats
(10) Areas that sustain Remnant Species
(11) Significant Flora

Two additional coastal resource types that should be added to the above list that were not directly identified in the geographic areas of particular concern report are barrier islands and uplands.

The barrier islands, Ship, Cat, Horn and Petit Bois, and including part of Dauphin Island in Alabama, encompass the Mississippi Sound. They were formed during the last glacial period (Pleistocene).

Only Cat Island, south of Long Beach-Gulfport, remains in private ownership. The other islands are part of the Gulf Islands National Seashore group.

Uplands, generally described for purposes of this plan are "those lands above the water mark of ordinary high tide".

A brief description of the above identified "natural coastal resources" are explained below. These areas have been previously mapped and are included in the geographic area of concern draft report.

1. COASTAL WETLANDS AND ESTUARIES

   Coastal Wetlands are publicly owned lands subject to the ebb and flow of the tide which are below the watermark of ordinary high tide, all tidal influenced riverine systems and all publicly owned accretions above the watermark of ordinary high tide. An estuary is that part of a river or other body of water having unimpaired connection with the open sea, where sea water is measurably diluted with fresh water derived from land drainage.

2. FRESHWATER SWAMPS AND MARSHES

   Swamps are areas of water saturated ground. They are usually found within the flood plains and are characterized by a high water table, predominately internal drainage and water-tolerant vegetation.

3. SURFACE WATERS

   Surface waters are waters occurring in any watercourse, lake or other natural water body of the State as delineated by the Board of Water Commissioners.

4. NATURAL RIVERS

To be classified under the Wild and Scenic Rivers Act of 1968 a river must be in a free flowing condition. There are three classifications of natural rivers - (1) wild, (2) scenic, and (3) recreation.

5. SIGNIFICANT BEACHES

Significant beaches are land areas without vegetative covering, consisting of unconsolidated soil material that extends landward from the mean low tide to a point where any one or a combination of the following occur: (1) vegetation or (2) a distinct change in predominant soil particle size or (3) a change in slope or elevation which alters the physiographic land form and this constitutes the transition into dunes or wetlands.

6. MINERAL RESOURCE AREAS

Mineral resource areas are those areas where the mineral accumulation is of sufficient size or significance to be of more than just local importance and where the mineral is apt to be exploited in the near future and where mining or excavation operations would cause some disruption of other land use activities at the site while mining or excavation is in progress.

7-9. HABITATS OF MAJOR FISHERIES

Habitats of major fisheries are divided into three elements: (1) shellfish, (2) saltwater finfish and (3) freshwater finfish.

Shellfish habitat - these are areas where oysters grow in sufficient quantity to be harvested commercially.

Saltwater fish habitat - these are areas recognized for their propogation of the seafood and aquatic life in the State of Mississippi.

Freshwater fish habitat - these are areas that constitute a vital segment of the State of Mississippi.

10. AREAS THAT SUSTAIN REMNANT SPECIES

Areas that sustain remnant species are areas where species or subspecies of wildlife indigenous to the state may be found to be endangered within the state and should be accorded protection in order to maintain and, to the extent possible, enhance their numbers.

11. SIGNIFICANT FLORA

These are areas which contain rare, unique or endangered flora indigenous to the state.

INDUSTRIAL PARKS AND INDIVIDUAL SITES

Land use surveys conducted in 1972 by the Gulf Regional Planning Commission indicated that over 10,000 acres in Hancock, Harrison, and Jackson Counties were being utilized for industrial purposes. These uses ranged from small insignificant sites such as borrow pits and automobile junk yards to major industries like the Ingalls Division of Litton Shipbuilding in Pascagoula.

The purpose of this section is to generally identify industrial areas in the three coast counties. Industrial land uses were grouped into two segments covering individual industries of major significance and both existing and proposed industrial parks.

INDIVIDUAL INDUSTRIES

Individual industries are listed on the following table (Table 7) which includes this site name, number of employees, industrial products and corresponding standard industrial classification (SIC). Acreage on these individual sites was not obtained, however, the general location and size of the sites can be found on maps at the offices of the Mississippi Marine Resources Council.

INDUSTRIAL PARKS

The term industrial parks as used in this report has two connotations - industrial parks and industrial districts. Parks may be defined as those areas legally delineated and subdivided, cleared and made void of non-conforming land uses, equipped with various facilities, utilities and services optionally supplied in parks, and otherwise made ready for immediate occupancy by industrial firms. Industrial districts may be defined as those areas which have been legally set aside or zoned for industrial use. Unlike parks, districts, used in this context, may or may not have other land uses occupying space inside the district limits.

Industrial park data are summarized in Table 8. Individual parks are identified by name, township codes, and owners. Other data include park size and available acreage, existing utilities and services, water use and discharge and types of available transportation. Also shown is the industrial park or district classification.

PARKS AND RECREATION

Recreational movements and activities are profoundly affected within any given area by trends in growth and development. Industrialization, commercialization, population concentrations and shifts, and urban and sub-urban development are most often accomplished by the absorption of open space. This being true, it can be said that growth patterns are directly influenced by availability of open space. It follows logically that planned and managed open space in turn can influence growth patterns, adding further emphasis to the importance of a regional plan for open space management and conservation.

Recreational trends also reflect patterns of increasing personal income, and an increasing involvement of the private sector in recreation-oriented development.

Other more subtle factors which exert an influence on recreation desires, activities, and potentials include governmental policies and on going recreation programs.

Concern on the part of public officials is reflected in the numerous park and playground commissions active in most municipalities throughout the region.

In order to provide an overview of existing public recreation facilities, Table 9 was developed. Data reflected therein are the results of work performed in the summer of 1975 by the Gulf Regional Planning Commission.

Only public recreation and major semi-public and commercial activities are identified.

TABLE 7

REGIONAL INDUSTRIAL SITES

SITE NAME	NO. OF EMPLOYEES	PRODUCT	SIC CODE
		HANCOCK COUNTY	
UNINCORPORATED			
J. L. Fabricating, Inc.	50	Steel Fabrication	3441
Jackson Landing Shipyard	150	Petroleum Barges	3731
		HARRISON COUNTY	
PASS CHRISTIAN			
Pass Christian Industires, Inc.	495	Ladies Jeans & Shirts	2339
Gulf Coast Pre-Stress Co., Inc.	79	Pre-stress concrete products	3272
GULFPORT			
Masonite Corp. - Alpine Division	9	Phenol Formaldehyde resin	2821
		Phenol Formaldehyde adhesive	2891
Bayou Steel Corp.	63	Boats & Barges	3732
		Drilling Platform Components	3533
Chattanooga Glass Company	234	Glass Bottles	3221
Chemfax, Inc.	41	Petro. Hydrocarbon Resin	2821
Clearspan Components, Inc.	98	Wall & Roof Trusses	2452
		Windows & Doors	2431
Coast Coca-Cola Bottling Co.	56	Soft Drinks	2086
Coast Materials Co.	50	Ready-Mixed Concrete	3273
Colonial Baking Co.	130	Bread & Rolls	2051
Conalco-Olin Corporation	168	Aluminum extrusions	3354
Glenbrook Laboratories - Sterling Drugs	85	Laxatives	2834
Gulf Coast Tool & Die Ltd.	100	Metal Stampings	3469
		Custom Machine Tools	3544
Gulf Paving, Inc.	125	Asphaltic Concrete	2951
NATCO	231	Steel Fabrication	3443
Gulfport Creosoting Co.	86	Treated Pine Poles	2491
KUDA, Inc. No. 1	52	Ladies & Mens Apparel	2331
Marine Systems	50	Metal Fabrication	3441
		Wood Fabrication	2431
Maybelle Dress Mfg. Co., Inc.	200	Ladies Apparel	2339
PACECO	205	Heavy Steel Fabrication	3441
		Barges & Tugboats	3731
Plastifax, Inc.	24	Chlorinated Paraffin	2865
		Metal Soaps	2869
Reichhold Chemicals, Inc.	71	Hydrocarbon resins	2821
		Antioxidants	2869
Southern Precision Steel Co.	130	Cold-finished carbon & alloy bars	3316
Struthers Wells-Gulfport, Inc.	117	Sewage treatment equipment	3443
Teledyne Irby Steel	200	Pressure vessels & Steel fabrication	3443
McElroy Machine & Mfg.Co.	23	Marine Wenches	
		Marine Propellar Shafts	
Miss.Power Co. -Plant Jack Watson		Electrical Generating Plant	

REGIONAL INDUSTRIAL SITES

(Continued)

SITE NAME	NO. OF EMPLOYEES	PRODUCT	SIC CODE
BILOXI			
Barq's Bottling Co.	50	Soft Drinks	2086
Biloxi Pre-Stress	47	Pre-stressed concrete product	3272
Borden Company	90	Dairy Products	2026
C.C. Company, Inc.	75	Canned Seafood	2091
Clements Wire Mfg.Co.	51	Automotive Wire Harness	3714
DeJean Packing Co., Inc.	60	Canned Seafood	2091
		Cat Food	2047
Del's Seaway Shrimp & Oyster Co.	150	Frozen Shrimp & Oysters	2092
R. Fournier & Sons	40	Shrimp, Crab & Crab meat	2092
C.F. Gollott & Son Seafood Co.	35	Shrimp, Crab & Crab meat	2092
E.M. Gollott & Son Seafood Co.	18	Frozen Shrimp	2092
Gollott & Canaan Seafood Co.	15	Frozen Crabmeat & Oysters	2092
The M.H. Graham Corp.	85	Electrical Appliances	3634
		Household Metal Products	3469
Gulf Publishing Company, Inc.	270	Newspaper	2711
Leckich & Fayard Seafood Co.	115	Frozen Shrimp	2092
Mavar Shrimp & Oyster Co., Inc.	100	Canned Shrimp & Oysters	2091
Moore Seafood Co.	55	Canned Shrimp	2091
		Frozen Shrimp	2092
Shemper Seafood Co.	75	Frozen Seafood	2092
West Seafood Co.		Seafood Products	2092
Kulji's Seafood & Ice Co.		Seafood Products	2092
Sea Coast Company		Seafood Products	2092
Cruso Canning Company		Canned Seafood	2091
Weems Bros.Seafood Co.		Seafood Products	2092
L.D. Gollott Seafood Co.		Seafood Products	2092
Swarez Seafood Co.		Seafood Products	2092
E.R. Gollott Seafood Co.		Seafood Products	2092
Hygiene Shell Co. Seafood		Seafood Products	2092
Southern Shellfish Co.		Seafood Products	2092
Bayview Foods, Inc.			
Biloxi Canning & Packing Co.,Inc.		Seafood Products	2092
	JACKSON COUNTY		
OCEAN SPRINGS			
Coca Cola Bottling Co., Inc.	49	Soft Drinks	2086
Ferson Optics	211	Optical Equipment	3832
E. R. Moore Co.	98	Ladies Gym Suits	2339
		Academic Gowns	2389
Toche Enterprises, Inc.	82	Steel Seagoing Vessels	3732
GAUTIER			
Delta Creosoting Co., Inc.	42	Creosote piling,poles,post,	2491
MOSS POINT			
Crossfield Products Corp.	7	Latex Industrial Flooring	2851
The Fishmeal Co., Inc.	70	Menhaden Fish Meal	2077

REGIONAL INDUSTRIAL SITES
(Continued)

SITE NAME	NO. OF EMPLOYEES	PRODUCT	SIC CODE
MOSS POINT continued			
Halter Marine Fabricators, Inc.	350	Offshore Supply Ships	3731
International Paper Company	1504	Paper Products	2621
J.M. Rogers & Sons, Inc.	82	Lumber	2426
		Wood Pollets	2448
Standard Products, Inc.	47	Fish Meal & Oil	2077
Thiokol Corp.	178	Polysulfide rubbers & Polyacrylates	2822
Mississippi Export Railroad			
Zapata-Haynie Products	76	Menhaden fish meal & oils	2077
Webb Paving		Asphalt Paving	
Cumbest Manufacturing Co.,Inc.		Lumber	2421
PASCAGOULA			
Bayou Crab Company	70	Processed Crabmeat	2091
Cinderella Knitting Mills	400	Men & Boy's Knit Underwear	2322
Continental Can Company, Inc.	135	Metal Bottle Caps	3466
Corchem Division of Corhart Refractories Co.	80	Magnesium Oxide & dolomitic	2819
First Miss. Chemical Corp.	48	Orthotoluidine	2865
Frigitemp Marine Division	550	Ship sheet metal work furniture, etc.	2599
Gulf City Fisheries	400	Fresh & Frozen Seafood	2092
Ingalls Shipbuilding Division	19000	Naval & large commercial vessels	3731
Miss. Chemical Corporation	535	Fertilizers	2873
		Sulfuric Acid	2819
The Miss. Press Register	92	Newspaper	2711
Pavco Industries, Inc.	140	Plywood paneling	2435
		Sanded hardboard	2426
The Quaker Oats Co.	175	Canned cat & dog food	2047
Standard Oil Co.	620	Petroleum Fuels	2911
F.B. Walker & Sons Shipyard	99	Boat Building	3732
Castigliola		Seafood Products	2092
Clark Seafood		Seafood Products	2092
Graham Boats, Inc.		Boat Building	3732

SOURCE: Parametric Overview of Land Use and Socio-Economic Activities, 1976, Gulf Regional Planning Commission

TABLE 8
INDUSTRIAL PARK SUMMARY
HANCOCK, HARRISON AND JACKSON COUNTIES
GULF REGIONAL PLANNING COMMISSION - JANUARY 1976

NAME	OWNERSHIP	Size (Acres)	Occupied Acreage	Available Acreage	UTILITIES Water	Gas	Electric	Sewer	Water Used (gal/day)	Waste Discharge (gal/day)	Transportation Rail	Roads Water	Roads Air	Remarks
HANCOCK COUNTY														
Port Bienville Ind. Park	Hancock County	1460	291	1169	x	x	x	x	8,000	2,000	x	x	x	Industrial Park
HARRISON COUNTY														
Pass Christian Ind. Park	Harrison County	190	94	96	x	x	x	x	10,500		x		x	Industrial Park
Long Beach Ind. Park	Harrison County	500	0	500	x		x	x					x	Industrial Park
Bayou Benard Ind. Park	Harrison County	1450	949	501	x	x	x	x		100,000	x	x	x	x Industrial Park
East Harrison Co. Ind. Park	Harrison County	83	33	50	x	x	x	x	9,600		x		x	Industrial Park
JACKSON COUNTY														
Ocean Springs Ind. Park	Jackson County	15	6	9	x		x				x		x	x Industrial Park
Bayou Casotte Public Terminals	Jackson County	25	0	25	x		x				x	x	x	x Industrial Dist.
Bayou Casotte No. 1	Jackson County	242	0	242	x	x	x				x	x	x	x Industrial Dist.
Bayou Casotte No. 2	Jackson County	649	4	645	x	x	x				x	x	x	x Industrial Dist.
Greenwood Island Ind. Park	Jackson County	311	0	311	x	x	x	x				x	x	x Industrial Dist.
West Bank Ind. Park No. 1	Jackson County	6	0	6	x	x	x				x	x	x	Industrial Dist.
West Bank Ind. Park No. 2	Jackson County	65	0	65	x		x					x	x	Industrial Dist.
	TOTALS	4996	1377	3619										

SOURCE:
1. Miss. Research & Development Center, Long Beach - General Information
2. Hancock County Port & Harbor Commission - Water Use & Discharge
3. Harrison County Development Commission - Water Use & Discharge
4. Jackson County Planning Commission - General Siting Information

TABLE 9
REGIONAL PARKS & RECREATION AREAS

FACILITY NAME	TYPE OF FACILITY	OWNERSHIP	ACREAGE
	HANCOCK COUNTY		
BAY ST. LOUIS			
Bay High School	School Playfield	City School System	15
Bay Jr. High	School Playfield	City School System	4
North Bay Elem. School	School Playground	City School System	5
Christ Episcopal	Parochial School Playground	Church	4
Devine Word Seminary	Parochial School Playfield	Church	3
Our Lady of the Gulf	Parochial School Playground	Church	2
St. Joseph Academy	Parochial School Playground	Church	4
St. Stanislaus College	Parochial School Playfield	Church	25
Ingram Elem. School	School-City Playground	City of Bay St.Louis	1
Dunbar & Ulman Field	City Playfield	City of Bay St.Louis	2
Julia & Dunbar Park	City Mini-Park	City of Bay St.Louis	1
Main & Necaise Park	City Mini-Park	City of Bay St.Louis	1
St.Francis & Bookter Park	City Mini-Park	City of Bay St.Louis	1
WAVELAND			
Waveland Elem. School	School Playground	City School System	3
St. Clares' Elem. School	Parochial School Playground	Church	3
Elmwood Park	City Playfield & Park	City of Waveland	5
UNINCORPORATED AREA			
Hancock North Central School	School Playfield & Playground	County School System	30
C. B. Murphy School	School Playground	County School System	3
Hancock Co. Beaches	Public Beach	County	135
Buccaneer St. Park	State Park	State of Miss.	394
	HARRISON COUNTY		
PASS CHRISTIAN			
Pass Christian High School	School Stadium	City School System	-
Parker Memorial Park	Community Playfield	City of Pass Christian	-
Pass Christian Harbor	Community Park	City of Pass Christian	3
Harbor Park	Community Park	City of Pass Christian	25
Church St. Park	Neighborhood Playfield	City of Pass Christian	1
War Memorial Park	Neighborhood Playfield	City of Pass Christian	5
Pass Christian Yacht Club	Yacht Club & Marina	Club-Semi-Public	3
LONG BEACH			
Long Beach High School	School Playfield,Gym Tennis Courts & Stadium	City School System	-
O'Malley Park	Community Playfield	City of Long Beach	10
Church Street Park	Community Playground	City of Long Beach	6
Skellie Park	Neighborhood Playfield	City of Long Beach	3
Railroad St. Park	Neighborhood Playfield	City of Long Beach	2
Long Beach Basketball Court	Neighborhood Playfield	City of Long Beach	1
Long Beach Recreation Center	Recreation Center	City of Long Beach	1
Small Craft Harbor	Small Craft Harbor	City of Long Beach	2

REGIONAL PARKS & RECREATION AREAS
(Continued)

FACILITY NAME	TYPE OF FACILITY	OWNERSHIP	AVERAGE
	HARRISON COUNTY		
GULFPORT			
Handsboro School	School Playfield	City School System	4
Anniston Avenue School	School Playfield	City School System	2
Mississippi City School	School Playfield	City School System	4
28th Street School	School Playfield	City School System	8
Gulfport High School	Gym & Related Facilities	City School System	-
Gulfport East High School	Gym, Tennis Courts & Related Facilities	City School System	-
Bayou View Jr. High School	Gym,Playfield & Related Facilities	City School System	-
Gulfport East Jr. High	Gym, Tennis Courts & Related Facilities	City School System	-
West Gulfport Jr. High	School Playfield	City School System	-
Milner Stadium	Stadium	City of Gulfport	-
Fairgrounds Playfield	Playfields & Fairgrounds	City of Gulfport	26
33rd Avenue Playfield	Community Playfield	City of Gulfport	14
Bayou View Playfield	Community Playfield	City of Gulfport	8
Beach Blvd. Playfield	Community Playfield	City of Gulfport	18
Bayou View Park	Community Park	City of Gulfport	10
Westside Community Park	Community Park & Center	City of Gulfport	19
Gaston Point Playfield	Neighborhood Playfield	City of Gulfport	3
North Gulfport Playfield	Neighborhood Playfield	City of Gulfport	2
2nd Street Playfield	Neighborhood Playfield	City of Gulfport	3
Hill Park	Neighborhood Park	City of Gulfport	37
Jones Park	Memorial Park	City of Gulfport	4
Broadmore Place Park	Neighborhood Mini-Park	City of Gulfport	.3
19th Street Playfield	Neighborhood Playfield	City of Gulfport	3
East Side Mini-Park	Neighborhood Mini-Park	City of Gulfport	.5
Hewes Recreation Center	Community Center	City of Gulfport	4
East Side Community Center	Community Center	City of Gulfport	5
Moses Pier	Public Fishing Pier	City of Gulfport	-
Small Craft Harbor	Public Marina	City of Gulfport	30
Gulfport Yacht Club	Yacht Club & Private Marina	Yacht Club-Private	4
Bayou View Golf Course	Golf Course	Private-lease from City	140
Gulfport Par-Three Course	Par-Three Golf Course	Commercial	39
Broadwater Golf Course	Golf Course	Commercial	160
Marine Life	Marine Aquarium	Commercial	2
BILOXI			
Biloxi High School	School Playfield & Related Facilities	City School System	-
Central Jr. High School	School Gym & Related Facilities	City School System	-
Fernwood School	School Gym & Related Facilities	City School System	-
Michel Jr. High School	School Gym & Related Facilities	City School System	-
Biloxi Municipal Stadium	Municipal Stadium	City of Biloxi	-
Hiller Park	Community Park	City of Biloxi	75
Tanglewood	Community Park	City of Biloxi	2.5
Brian Park	Community Park & Center	City of Biloxi	-
Circle Park	Community Park	City of Biloxi	-
Biloxi Community Center	Community Center	City of Biloxi	-
Division Street Community Center	Community Center	City School System	-
Meault Center	Community Center	City of Biloxi	-
West Biloxi Center	Community Center	Lutheran Church	-

REGIONAL PARKS & RECREATION AREAS
(Continued)

FACILITY NAME	TYPE OF FACILITY	OWNERSHIP	ACREAGE
	HARRISON COUNTY (continued)		
BILOXI (Continued)			
East End Center	Community Center	City of Biloxi	-
Back Bay Little League Park	Little League Playfield	City of Biloxi	5.5
Lee Street Baseball Park	Neighborhood Playfield	City of Biloxi	5
McDonnell Playfield	Neighborhood Playfield	City of Biloxi	7
Rose Street Playfield	Neighborhood Playfield	City of Biloxi	3.3
St. Michael Playfield	Neighborhood Playfield	City of Biloxi	3.5
West End Park	Little League Playfield	City of Biloxi	2.5
Business Men's Club Playground	Neighborhood Playground	City of Biloxi	3
St. Mary's Playground	Neighborhood Playground	City of Biloxi	1.5
Biloxi International Plaza	Neighborhood Plaza & Park	City of Biloxi	2
Miramic Mini-Park	Neighborhood Mini-Park	City of Biloxi	1
Guice Park	Neighborhood Plaza-Park	City of Biloxi	1
Biloxi Small Craft Harbor	Small Craft Harbor & Marina	City of Biloxi	12
Biloxi Fishing Bridge	Fishing Bridge	City of Biloxi	-
Biloxi Yacht Club	Yacht Club & Marina	Private	5
Broadwater Beach Marina	Small Craft Harbor	Private-Commercial	10
Amusement Park	Amusement Park	Commercial	2
Deer Ranch	Amusement Park	Commercial	7
Goofy Golf	Amusement Park	Commercial	2
Broadwater Sun-Golf Course	Golf Course	Commerical	160
Edgewater Golf Course	Golf Course	Commercial	125
Sunkist Golf Course	Golf Course & Club	Private	120
UNINCORPORATED AREA			
Airey Lake Recreation Area	Camping & Picnic	U.S.Forest Service	6
Big Biloxi River Recreation Area	Camping & Picnic	U.S.Forest Service	27
Big Foot Horse Trail	Riding Trail	U.S.Forest Service	7
Tuxachanie Hiking Trail	Hiking Trail	U.S.Forest Service	17
Biloxi Par-Three Golf Course	Golf Course	Commercial	32
Harrison County Beach	Public Beach	Harrison County/Miss.	-
Saucier Little League Field	Little League Playfield	Unknown	2
D'Iberville Little League Field	Little League Playfield	Unknown	2
Lizanna Little League Field	Little League Playfield	Unknown	2
Orange Grove Little League Field	Little League Playfield	Unknown	2
Pineville Little League Field	Little League Playfield	Unknown	2
Harrison County Fishing Pier	Public Fishing Pier	Harrison County	2
Camp Wilkes	Boy Scout Camp	Boy Scout Council	89
Harrison Central High School	School Playfield & Related Facilities	County School System	-
	JACKSON COUNTY		
OCEAN SPRINGS			
Freedom Field	School Playfield	City School System	4
Vermont St. Playground	School Playground	City School System	1
Greyhound Stadium	Stadium	City & School	19
Magnolia Park	Community Park	City of Ocean Springs	20
Pecan Park	Community Park	City of Ocean Springs	21
Little Children's Park	Neighborhood Playground	City of Ocean Springs	4

REGIONAL PARKS & RECREATION AREAS
(Continued)

FACILITY NAME	TYPE OF FACILITY	OWNERSHIP	ACREAGE
	JACKSON COUNTY		
OCEAN SPRINGS (Continued)			
Ocean Springs Recreation Center	Community Center	City of Ocean Springs	1
Parktown East	Neighborhood Park	City of Ocean Springs	3
Clayboy Park	Neighborhood Playfield	City of Ocean Springs	5.5
Hallstead Rd.Tennis Court	Tennis Courts	City of Ocean Springs	8
Ocean Springs Small Craft Harbor	Small Craft Harbor	City of Ocean Springs	-
MOSS POINT			
Mayo Elementary School Playground	School Playground	City School System	2
Bellview Park	Community Park	City of Moss Point	19
Magnolia Park	Community Park	City of Moss Point	9
Curt Street Playfield	Community Playfield	City of Moss Point	13
Frederick St. Playfield	Community Playfield	City of Moss Point	10
Moss Point Recreation Center	Community Center	City of Moss Point	1
Gautier Field	Semi-Public Playfield	Dixie Youth Baseball League	4
St.Joseph Church Playfield	Semi-Publie Playfield	Chruch	2
PASCAGOULA			
Colmer Jr. High Playfield	School Playfield	City School System	10
Pascagoula City Park	Community Park	City of Pascagoula	8.5
Davenport Playfield	Neighborhood Playfield	City of Pascagoula	2
Flannegan Playfield	Neighborhood Playfield	City of Pascagoula	2
Gibson Playfield	Neighborhood Playfield	City of Pascagoula	2
Ingalls Playfield	Neighborhood Playfield	City of Pascagoula	2
John Ingalls	Neighborhood Playfield	City of Pascagoula	2
War Memorial Stadium	Stadium	City of Pascagoula	4
Parsley St. Mini-Park	Neighborhood Mini-Park	City of Pascagoula	1
Live Oak Mini-Park	Neighborhood Mini-Park	City of Pascagoula	.5
Pascagoula Recreation Center	Recreation Center	City of Pascagoula	7
Pascagoula Inner Harbor	Harbor & Marina	City of Pascagoula	4
Longfellow House & Gardens	Pool, Golf & Tennis	Litton Industries	70
Pascagoula Country Club	Golf Course	Private - Club	200
Aquatic Club Pool	Swimming Pool	Pirvate - Club	1
Coastline Pool	Swimming Pool	Pirvate - Club	1
Fun Spot	Miniature Golf	Commercial	4
UNINCORPORATED			
Softball Field	Community Playfield	County-Community	10
Gulf Park Estates	Marina, Golf Course & Pool	Private Corporation	-
Hickory Hills Country Club	Golf Coruse & Pool	Private Corporation	-
St. Andrews on the Gulf	Golf Course, Tennis & Pool	Private Corporation	-
Gulf Hills Dude Ranch	Golf Course, Tennis & Stables	Private Corporation	1000
Gulf Islands National Seashore (Include Petit Bois, Horn and Ship Islands)	Camping, Swimming, Fishing	National Park Service	

PART III

PERMISSIBLE LAND AND WATER USES

REQUIREMENTS OF THE CZM ACT

The Coastal Zone Management Act requires that:

"The management (plan) must show evidence that the State has developed and applied a procedure for defining 'permissible land and water uses within the coastal zone and which have a direct and significant impact on the coastal waters,' which includes, at a minimum:

(1) a method for relating various specific land and water uses to impact upon coastal waters, including utilization of an operational definition of "direct and significant impact,"

(2) an inventory of natural and man-made coastal resources (see Part II),

(3) an analysis or establishment of a method for analysis of the capability and suitability for each type of resource and application to existing, projected or potential uses,

(4) an analysis or establishment of a method for analysis of the environmental impact of reasonable resource utilizations." Section 305(b)(2).

PURPOSE

Two further tasks were performed in determining those uses which have a direct and significant impact on the coastal waters.

The second task was a determination of those land and water uses that would be assessed for potential impact. These were based in part on findings from the resources inventory. After an initial determination of those possible uses which would be permissible, a tentative determination of "direct and significant impact" was developed. This definition was further modified and tested along with the result of the third task.

For the third task, a method was needed to test these potential uses. This method, although not complete in every detail, attempts to establish an analysis of the capability of each resource to support various types of uses for sustained and undiminished yield of those renewable resources. Within this method is included an analysis of the impact of various resource uses upon the natural environment (air, land, water).

LAND AND WATER USES

As an aid in evaluation of activities located or considering a location in the Coastal Zone of Mississippi, two matrix tables were developed. These are contained in the appendix. Water uses were separated from land uses since the activities did not in themselves cause physical alteration of the shoreline, being primarily water-borne or located offshore where only bottom characteristics would be physically altered with possible attendant chemical and biological disturbance.

LAND USE

To determine the types of activities and nature of their physical facilities that were drawn to or of necessity required waterfront locations, an investigation was made of existing development within the three coastal counties including: residential, commercial, processing and manufacturing (industrial), transportation, recreation and institutional uses. Also noted was the location, whether it abutted and/or occupied submerged lands of the state wetlands. In most instances, the use had caused some alteration of the shoreline. And, in several areas major changes were encountered. In every case direct and significant physical impact upon the state wetlands and coastal waters had occurred, with some indeterminate biological and chemical impacts as well.

The "X" array of the matrix is entitled Permissible Use according to the definition of such uses. This axis presents the social and economic activities. The "Y" array of the matrix is entitled Factors, presenting physical facilities and support services needed (also a form of activity) to sustain the basic activities and considerations that influence managerial decisions.

Permissible Land Uses (X Array).

Residential:

- Land with direct access or indirect access to navigable waters that requires periodic dredging of boat channel and a spoiling area for dredged materials, on an individual ownership basis.
- Development where community marina serves in place of individual waterfront lots, as advertised.
- Development where both individual and community boating accommodations are available, as advertised.

Commercial

- The quay, dockside, or pier wholesaling and/or retailing of fin-fish, shrimp and shellfish unprocessed to the public.
- The waterside retailing of fishing equipment and bait.
- Use of the waterfront, including marina and boating services that enhances hotel and/or motel attractiveness.
- Eating establishments specializing in seafoods that use a waterfront location as a setting to draw customers.
- The retailing of boats (power and sail) and the necessary equipment and service that is required for maintenance and operation.

Processing and Manufacturing:

- Construction of naval vessels; vessels for the merchant marine with maintenance and/or repair services as needed.
- Construction of craft for the commercial fishing fleet, offshore workboats and craft for both charter and pleasure.
- Metal fabrications that are portions of outer continential shelf drilling and production platforms, usually transported by barge to site of installation.
- The refining of petroleum into distillates with crude oil being received by pipeline and by tanker.
- The manufacture of paper from wood pulp with cordwood being received by barge shipment.
- The processing of finfish, shrimp and shellfish into seafoods for both human and animal consumption.
- The manufacture of agricultural chemicals, and involves shipment by bulk cargo carrier.
- Production of poles, piling and timbers and their shipment to domestic and foreign markets.

Mining and Energy:

- The extraction of oil and gas and their transportation to shore from offshore drilling and production platforms.

- Extraction of chemicals from sea water with pipeline intake and transport.

- the mining of sand, gravel and shells requiring dredging and barge transport.

- The production of electrical energy in which coal is moved by barge to plant site for generation purposes.

Transportation:

- Internal roads that provide immediate access to waterfront land uses and that cross bottoms of the wetlands.

- Highways that provide a way for movement of goods and people that connect with major local, regional and national markets, and that cross the state wetlands in particular locations.

- Spur railroad lines that provide immediate and direct service to ports and harbor industrial areas, including dockside services.

- Main connector railroads that transport cargoes and commodities and cross the state wetlands.

- Pipelines that carry oil and gas and rest on the bottom of the coastal wetlands.

- Airport that services the national defense establishment and requires shoreline stabilization to protect runway.

- Cargo services for international and coastal carriers such as freighters, tankers and barges involves the provision of moorings and berthing space; the loading, unloading and storage of cargoes; ship fueling, waste transfer and chandler services. Also common carriers are needed for the transport of cargoes to and from the port facility.

- Berthing services are needed for fishing vessels, charter craft and pleasure craft during the off seasons. Such services are usually provided by marinas and small craft harbors where fueling, waste transfer and minor maintenance facilities are available.

Recreation:

- State parks which provide the pleasures of boating and require access to navigable waters.

- Small craft launching and retrieval facilities developed for public use and enjoyment.

- Public beaches providing many recreational areas and activities which do periodically need replenishment of sand.

- Offshore islands of the Gulf Islands National Seashore where natural scenes are preserved along with sites of historic interest, which need protection from beach erosion.

- Fishing piers and jetties for public use and enjoyment and that occupy submerged lands of the wetlands.

- Private fishing camps for individual and family pleasure with boating facilities and access to navigable waters.

Institutional:

- Local entities such as schools, institutions of higher learning, and fraternal bodies that have waterfront facilities.
- State supported activity in the form of the Gulf Coast Research Laboratory with its small craft harbor and access channel and the Point Cadet facilities.
- Federal installations are represented by the Keesler Air Force Training Base which abuts the wetlands and the NASA National Space Technology Laboratories. The laboratories have a complete internal water transport system with channels, locks, docks and wharves. However, the entire system is directly dependent upon the East Pearl River barge channel.

Factors Relating to Coastal Activities (Y Array)

Significance:

- "Local," activities effecting, primarily, the social-economic development and environment of the Mississippi coastal community.
- "Regional," activities whose beneficial impact extends beyond the coastal community and which may be interstate as well as intrastate.

- o "National," activities where interests of the entire nation are being served. Many activities will have a degree of national importance, however, those such as the Department of Defense and the NASA National Space Technology Laboratories are representative of a greater national interest. An activity may be placed in one, two or all three categories, thus indicating its comparative level of significance.

Water Oriented Facilities and Services

Classification:

Land use classifications are stated in simplified manner in the Y array these being: residential, commercial, industrial (processing, manufacturing, mining and energy), and institutional.

When considered appropriate, availability of facilities and/or services may be indicated by use of the terms: private, semi-public and public.

Land Support Facilities and Services

Major types of facilities are: marinas, small craft harbors, ports, planned harbor and industrial area, planned industrial seaway, planned industrial complex and the independent facility. All facilities, in varying degree, occupy some part of what was once the coastal wetland, have caused alteration of the shoreline and, with exception of the independent facility, are dependent upon properly maintained navigation channels. All have a direct and significant impact upon the state wetlands and the coastal waters.

Types of Access to Natural Navigable Water

There are three types of navigation channels:

- o The ship channel which is the widest has operating depths varying from 30 feet at Gulfport to 40 feet at Pascagoula.
- o Barge channels are next in width with minimum operational depths ranging from 7 to 12 feet.
- o The smaller boat channels have depths from 4 to 7 feet.

All channels require periodic dredging and are confronted with spoil disposal problems.

Waterfront Development

Development has been separated into three basic areas of reference for convenience in evaluation, these being shoreline protection or stabilization, general features associated with marine facilities and services and special features related to water oriented activities.

- o Shoreline protection and stabilization can be accomplished in a number of ways and may or may not be directly related to marine facilities and services, a case in point being measures taken to protect the Mississippi shoreline from the ravages of tropical storms and hurricane tides. Such protection can take the form of bulkheads, rip-rap, seawall, sand berm or breakwater or various combinations of these forms. Usually a portion of the wetlands is lost in the installation process.

- General features presented are found in association with facilities and services rendered water oriented activities. Boat slips and finger piers are usually for small craft, while the massive east and west piers of the Port of Gulfport serve ocean-going vessels. All are necessary if the needs of pleasure craft, fishing vessels and the larger cargo vessels are to be satisfied. Such features include: boat slips, piers, wharves, quays, docks, open storage areas, protected storage areas in the form of transient sheds and warehouses, cargo handling facilities, vessel moorings and berthing, barge moorings and berthing, freight shipment, fueling and waste transfer, ships' chandler, building sites, and parking areas. Again, these features will occupy in part, areas that once were wetlands of the coastal zone.

- Special features of the coastal waterfront include sling hoist launching and retrieval of small craft, launching ways for small craft construction yards, and for larger naval and cargo vessels, petroleum storage facilities for tanker discharge, elevator storage for grains to be shipped by bulk cargo carriers, dry docks for vessel maintenance and repair, pipeline service, dredge service and workboat support service. Practically all special feature facilities and services need a maintained channel of appropriate depth and have removed a portion of once productive wetlands. Also there is a problem of spoil disposal.

Impact:

From description of the foregoing permissible land uses and the necessary support facilities and services it becomes evident that a direct and significant physical impact has been made. This has been accompanied by an undetermined loss of marine biota and chemical disturbance. The irretrievable loss of state wetlands has been compensated, in part, by development of major activities that have helped to diversify and strengthen the economic structure of the coastal area, the State and the interstate region. National interests have been served. However, such land use activities, by the nature of their impact, are considered subject to the coastal zone management program.

WATER USE

As in the case of land use, an investigation was made of the type and nature of water uses that existed in the Mississippi coastal zone, as defined within the body of this report.

The "X" array of this matrix is entitled Permissible Water Uses representing the social-economic activities encountered. The "Y" array of the matrix is entitled Factors indicating needed physical facilities and support services.

Permissible Water Uses (X array)

Commercial:

- Fishery activities in the catching or netting of finfish and shrimp and the tonging and/or dredging of shellfish.

- o Mariculture in the form of leased wetlands (bottoms) that can be used for the propagation and harvesting of oysters and other forms of marine life.

- o Charter craft that use the coastal waters for commercial fishing purposes.

Mining and Extraction:

- o The extraction of gas and oil and the transportation from offshore locations to shore processing points.

- o Sea chemicals derived from the waters or mined from the bottoms requiring barge or pipeline transport.

- o Sand, gravel and shell mining by dredging and needing barge movement to shore.

Transportation:

Navigation:

- o The movement of freighters, tankers, and barges under tow to destined ports, harbors and other areas requiring a maintained navigation channel, either coastal or international.

Navigation Aids:

- o The use of channel buoys and data buoys to assist in the

navigation of coastal waters promotes operational safety of the waterway system.

Recreation:

- Charter craft that provide sportfishing and find the waters of coastal Mississippi suited to the needs of their operations. Pleasure cruising by charter craft for the enjoyment of the area's natural and restful beauty.

- Sportfishing, sailing and motor boating are recreational activities that individual owners of small craft can enjoy and like charter craft require knowledge of coastal water depths and channels for navigation and safety of operation.

Factors Relating to Water Activities (Y array)

Significance:

- "Local," activities effecting, primarily the social-economic development and environment of the Mississippi coastal community.

- "Regional," activities whose beneficial impact extends beyond the coastal community and which may be interstate as well as intrastate.

- "National," activities where interests of the entire nation are being served (See permissible land use).

Water Oriented Facilities and Services:

Classification

Though no residential use of offshore coastal waters was encountered, facilities and services are needed in support of commercial, industrial and institutional activities.

When considered appropriate, availability of facilities and/or services may be indicated by use of the terms: private, semi-public and public.

Water Dependent Facilities and Services

Major offshore facilities are oil and gas drilling and production platforms, petroleum transfer terminals, piers and docks. Pipelines connect offshore platforms with shore facilities, and cross the submerged lands beneath the coastal waters, occupying a portion of the state wetlands. Workboats provide fuel, material and supply transfer and utilize channels where shallow waters are encountered.

Types of Navigation Channels

Though boat channels are needed in certain areas offshore, for most craft natural depths are sufficient for their operation. Barge transport uses the well maintained intracoastal waterway which traverses the Mississippi Sound in an east-west direction. Ocean-going vessels enter the coastal waters at the port of Gulfport or Pascagoula ship channels.

There are three types of navigation channels:

- o The ship channel which is the widest has operating depths varying from 30 feet at Gulfport to 40 feet at Pascagoula.
- o Barge channels are next in width with minimum operational depths ranging from 7 to 12 feet.
- o The smaller boat channels have depths from 4 to 7 feet.

All channels require periodic maintenance dredging, in addition to occasional enlargement, and have spoil disposal problems.

Coastal Water Monitoring Service

There exists a need for a greater intensity of activity to prevent the discharge of waste in the coastal waters, and to control fuel and oil spills that occur from marine activities.

Small dead cull fish have fouled beaches during operations of the fishing fleet, possibly the result of working too near the shore. Natural preditors normally prevent such an occurrence. Patrol vessels are needed to keep fishing operations the proper distance offshore.

Impact:

Movement of ships, barge tows and small craft on the coastal waters of Mississippi requires the presence and maintenance of navigation channels, resulting in a direct physical change of the natural configuration of the submerge wetlands. Growth of spoil areas may in

time change the flow of coastal water currents, as well as cover productive areas of the wetlands. However, larger vessels and ships could not enter the coastal water without the presence of suitable channels, and the loss of such traffic would cause serious economic repercussions. Marine activities in the coastal waters exert a direct and significant physical impact through their need for navigation channels. Also, there is present the potential for contamination from spills and poor fishing practices that result in both chemical and biological impacts. The dredging of channels and placement of spoil is considered a coastal management concern as is the protection of coastal water quality, and the movement of maritime commerce through the waters of the Mississippi coastal zone.

PERMISSIBLE USES

The following tables list the categories of land and water uses which are considered to be permissible. Table 10 shows 47 permissible land uses, divided into discernible categories. Table 11 shows 24 permissible water uses, similarly divided.

TABLE 10

PERMISSIBLE LAND USES

- Residential
  - Boat Mooring and Berthing
    - Single-Family Dwellings
    - Subdivision Development
    - Planned Unit Development
    - Other

- Commercial
  - Dockside Activities
    - Unprocessed
      - Wholesaling
        - Finfish
        - Shrimp
        - Shellfish
      - Retailing
        - Finfish
        - Shrimp
        - Shellfish
  - Bait and Tackle Shop
  - Resort Motels and Hotels
  - Seafood Eating Establishments
  - Marine Sales, Supplies and Services
  - Other

- Processing and Manufacturing
  - Shipbuilding and Repair
    - Naval Vessels
    - Cargo Carriers
  - Small Craft Construction
  - OCS Platform Sub-Assemblies
  - Petroleum Refining
  - Paper and Allied Products
  - Seafood and Related Products
  - Chemicals and Related Products
  - Timber and Tree Product Production
  - Other

- Mining and Energy
  - Oil and Gas Wells
  - Sea Chemical Extraction
  - Sand, Gravel and Shell Mining
  - Power Plants
  - Other

TABLE 10 (continued)

- Transportation
  - Roads
  - Highways
  - Railroad Spur
  - Railroad Main Connector
  - Pipeline
  - Airport
  - Other
  - Cargo Services
    - Coastal Vessels
    - International Vessels
    - Tugs and Barges
    - Other
  - Berthing Services
    - Fishing Fleet
    - Charter Craft
    - Private Craft
    - Other

- Recreation
  - State Parks
  - Boat Ramps
  - Public Beaches
  - Offshore Islands
  - Public Fishing Area
  - Private Fishing Camps
  - Other

- Institutional
  - Local
  - State
  - Federal

TABLE 11

PERMISSIBLE WATER USES

- Commercial
  - Fisheries
    - Finfishing
    - Shrimping
    - Shellfishing
    - Mariculture
  - Charter Craft
  - Other
- Mining and Extraction
  - Oil and Gas Wells
  - Sea Chemical Extraction
  - Sand, Gravel and Shell
  - Other
- Transportation
  - Navigation
    - International
      - Freighter
      - Tanker
      - Other
    - Coastal
      - Freighter
      - Tanker
      - Barge
      - Other
  - Research Vessels
  - Search and Rescue Vessels
  - Naval Vessels
  - Construction Vessels
  - Other
  - Navigation Aides
    - Data Buoys
    - Channel Buoys
    - Other
- Recreation
  - Charter Craft
    - Sportfishing
    - Cruising
    - Other
  - Private Craft
    - Sportfishing
    - Motor Boating
    - Sailing
    - Other
- Institutional
  - Local
  - State
  - Federal

METHODOLOGY FOR DETERMINING RESOURCE USES TO BE PERMITTED AND MANAGED IN THE MISSISSIPPI COASTAL ZONE UNDER THE COASTAL ZONE PROGRAM

GENERAL INTRODUCTION

The resource base of Mississippi's coastal zone is limited by a number of geographic, cultural, ecological and seasonal factors. Some of these factors have been identified while others remain to be identified as well as quantified through baseline studies. Where significant impacts and conflicts exist or can be predicted, knowledgeable and appropriate tradeoffs are required among coastal uses, and also between coastal and non-coastal uses.

In decisions concerned with making tradeoffs or permitting coastal resource uses, the general common denominator is demand-supply-price, i.e. what is wanted (demand), what is available and appropriate (supply), and what must be done to bring them together (price). These terms do not apply strictly to dollars. For example, demand includes ecological balance and aesthetic satisfaction as well as recreation, navigation, land development and the like. Price includes dollars; it also includes such things as air, water and biological quality foregone, locational advantages foregone, and human energy consumed in resource allocation.

To assist in making well-considered decisions regarding uses expected to have significant impacts and conflicts in the coastal zone, a methodology for evaluation must be employed by decision makers.

The broad purpose of the methodology is to assist in identifying and prioritizing conflicts and potential impacts in the coastal zone of Mississippi. Additionally, the methodology will assist in maintaining and improving the usefulness of the coastal zone of Mississippi and the Nation for now and the

future. Also, the methodology will be valuable in expediting a pertinent systematic mechanism for determing individual and cumulative resource uses and impacts to be permitted and managed in Mississippi's Coastal Zone. The Analysis Framework Chart is a component of the methodology and is the foundation upon which the methodology can be expanded for each category into a detailed evaluation as is appropriate for the proposed use. The Analysis Framework serves as a tool for systematically focusing and recording the judgements of informed experts and value issues as perceived by the public.

The utility of the methodology is that is will aid decision makers in the following important aspects concerning a proposed use of resources in the coastal zone.

1. Identification of conflicts which may arise as a result of the use.
2. Identification of impacts that may occur as a result of the proposed use. (Impact is defined as the difference in the state or value of the environment with, versus without the use of resources).
3. Evaluation and prediction of whether the impacts associated with the use will be <u>significant</u> (see discussion* following item 4). If an impact is determined to be significant, this does not imply that the proposed use is acceptable. The decision of acceptability will be rendered in the next step.
4. Through a process of weighing, determination of the acceptability of a significant impact and thus determination of whether the use as proposed will be permitted as proposed by the applicant, will be permitted with specified modifications or will not be permitted in the coastal zone. The evaluation of a project is to be conducted in such a manner that the project is approved or rejected in a manner least

costly to the environment and socio-economics, and so each accepted project is permitted and conducted in its most desirable form.

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* For determining whether an impact is significant, the following definitions will provide the guidelines for an operational approach.

Environmental Impact

An environmental impact represents a man-made change at the community and ecosystem level. At the time of the permit request and within the capacity of the state of the art, an environmental impact is significant if it results in a change that is measurable in a statistically sound sampling program and if it persists, or is expected to persist, more than several years at the population, community or ecosystem level. Changes in the biochemistry of individual organisms do not fall within this definition. If these changes cause or are expected to cause detectable changes in population-level parameters, e.g. brood success, then the impact would be defined as a significant environmental impact.

Socio-economic Impact

A socio-economic impact represents man-made changes and is significant where there is a change in economic productivity that is measurable or would be measurable in a statistically sound data gathering program and/or where there are changes in sociological qualities which are perceived to be undesirable by mankind at the community level within the coastal zone.

PROPOSED RESOURCE USE WITHIN THE COASTAL ZONE OF MISSISSIPPI--STANDARD INFORMATION REQUIREMENTS TO BE PROVIDED BY THE APPLICANT REGARDING THE PROPOSED USE AND PERMIT REQUEST

As part of the evaluation processes, certain standard information is necessary for the review of the proposed activity. This material, supplied initially, will provide for the review of the basic proposed activities of the applicant, giving generally the information to determine if the proposed activity would require a permit under the coastal program or if expanded data would be needed.

Listed below are the standard informational requirements.

1. Name, address and telephone number of the applicant, and if applicable, the applicant's agent.
2. Date.
3. Name and address of adjacent property owners.
4. Description of the proposed activity, its purpose or intended use.
5. Description of the proposed project
   - A. New or Maintenance Work
   - B. Dredging (types)
   - C. Construction
   - D. Filling
6. Location of project
   - A. City, Town or Landmark
   - B. Waterway
   - C. Section, Township, Range and County
7. Purpose of project and cost
   - A. Private
   - B. Commercial
   - C. Public
   - D. Other

8. Length of time required for the project
    A. Starting Date
    B. Completion Date
9. Measures to prevent detrimental offsite impacts
10. List of other approvals needed
11. Plan and drawing requirements
12. Certification of the applicant
13. Fees

MISSISSIPPI MARINE RESOURCES COUNCIL REVIEW

Upon receiving from the applicant the standard information regarding the proposed use within the coastal zone of Mississippi, the staff of the Mississippi Marine Resources Council will review the submitted information.

Prior to making a final decision, the Council may require the applicant to provide additional information not originally submitted as part of the Standard Information Requirements.

EXPANDED INFORMATION REQUIREMENTS NEEDED FROM APPLICANT REGARDING THE PROPOSED USE AND PERMIT REQUEST

Depending upon the character and magnitude of the proposed use and after review of the initial information submitted by the applicant, the Mississippi Marine Resources Council may request additional information about the proposed use. The request for additional information may include a detailed Environmental Impact Statement. Also, the following information may be requested:

1. As allowed by the state of the art, a summary which groups environmental impacts according to probability and severity of consequences.

2. A summary which identifies those who gain and lose from the proposed action and a formal proposal for compensation which is planned.
3. A statement by economists and social analysts which shows exactly how each important impact was treated and which impacts remain unquantified and unconsidered.
4. If additional information and changes are required in the final impact statement, an additional summary page(s) may be requested to show exactly the functional and operational changes made in the project or anticipated since the first permit request was submitted for review.

MISSISSIPPI MARINE RESOURCES COUNCIL DECISION REGARDING PROPOSED USE

After review of the standard and expanded information, the Council will render a decision which will be one of the following:

1. Use clearly defined as not requiring a permit from and management under the Mississippi Coastal Program.
2. Use clearly defined as requiring a permit from and management under the Mississippi Coastal Program.

If the decision is as specified in number two (2), the next step is to evaluate the proposed use or portion of the proposed use as to specifics of the permit and management requirements under the Mississippi Coastal Program.

USE OR PORTION OF USE NEEDING EVALUATION AS TO SPECIFICS OF THE PERMIT AND MANAGEMENT REQUIREMENTS UNDER THE MISSISSIPPI COASTAL PROGRAM

As stated previously, the Analysis Framework serves as a tool for systematically focusing and recording judgements of informed experts and value issues as perceived by the public.

At this point in the analysis framework, the evaluation process is divided into two major categories: (1) Resource Inventory and Evaluation of Resource(s) to be utilized on the basis of the proposed use, and (2) Evaluation of Use (Proposed Use) in the Coastal Zone of Mississippi.

Each of these major categories is expanded into sub-categories, and after evaluation, findings are presented for the sub-categories. The major categories and their associated sub-categories interrelate, thus the respective findings become an integral part upon which the suitability or acceptability of the proposed use is allowed as proposed, allowed with specified modifications or not allowed at all in the Coastal Zone of Mississippi.

For clarity in the evaluation procedure, the following sub-categories are defined:

1. Coastal Zone (of Mississippi) = The coastal zone of the state includes all the land and water area in the three coast counties of Hancock, Harrison and Jackson.
2. Regional = This includes the areas immediately adjacent to the Coastal Zone of Mississippi. This includes those counties within the State of Mississippi which are outside the coastal zone but are included in the Southern Mississippi Planning and Development District. Also included in the regional category are the counties/parishes of Alabama and Louisiana which are adjacent to the coastal zone and regional area of Mississippi.
3. State = The State of Mississippi other than the coastal zone and regional areas.
4. National = The territory of the United States with emphasis largely on the continental United States.

Participation of Organizations in the Evaluation Process Other than the Mississippi Marine Resources Council

For a proposed use requiring a permit, information from organizations other than the Mississippi Marine Resources Council will be obtained and will be part of the evaluation process. This information will be reflected in the decision as to the acceptability (suitability) of the proposed use in the coastal zone of Mississippi.

These other organizations will be notified of a permit request and upon their request will be provided the Standard Information and any Expanded Information submitted to the Mississippi Marine Resources Council for review and evaluation of the proposed use in the coastal zone.

All respondents will be encouraged to submit their information/statements within the outline of the Framework Analysis Chart (see Appendix). This will help focus the responses within an organized framework so that comparative analysis can be more readily accomplished.

When national interest is related to a proposed use, Federal decision makers will be provided the opportunity and encouraged to evaluate and submit information from a national interest viewpoint.

Governmental entities within the coastal zone, regional areas and residual areas of the State of Mississippi will be provided the opportunity and encouraged to evaluate and submit information concerning a proposed use requiring a permit.

When applicable, citizen groups and non-government agencies (local, regional, state, national) will be encouraged and afforded the opportunity to participate in the evaluation process of a proposed use. To accomplish this, and additionally, for the Mississippi Marine Resources Council to obtain a consensus of value issues concerning the proposed resource use, the following procedures will be

utilized. The citizen groups and non-government agencies will appoint respective representatives. The citizen group representatives and the non-government agency representatives will be the Mississippi Marine Resources Council's point of contact. These representatives will be encouraged to submit terse, concise information/statements which have been approved by the organizations and which defend (the pros) or rebuke (the cons) the proposed use. In the presentation of the information/statements, a distinction between factual findings and subjective judgements should be made clear.

DISCUSSION OF METHODOLOGY AND EVALUATION TECHNIQUES LEADING TO A DECISION AS TO THE ACCEPTABILITY OF A PROPOSED USE WITHIN THE COASTAL ZONE OF MISSISSIPPI

INTRODUCTION

Each proposed use within the coastal zone of Mississippi must ultimately be considered in terms of its specific impacts, local and otherwise. Thus, there will be a need to determine those impact facotrs to be evaluated on the basis of the proposed use.

The basic methodology will be to go through the Analysis Framework Chart and, with respect to a proposed use, under each category and its associated subcategories, decide significant topic areas which are to be evaluated and, if necessary, researched.

The evaluation of applicable factors will provide the "Findings" at points indicated in the Framework Analysis Chart. These Findings will be reflected in the decision as to the acceptability of the use as proposed by the applicant.

METHODOLOGY AND EVALUATION TECHNIQUES - BROAD SCOPE DISCUSSION

As has been previously noted and as can be seen from the Framework Analysis Chart, for the sub-categories under the major categories, there are "Findings" indicated on the Chart as F . At every point where a finding is indicated and where applicable in relation to a proposed use, a scenario will be provided. These scenarioes which will include information as to whether impacts and conflicts associated with the use can be predicted to be significant.

The individual Findings will contribute to and be reflected in eight major assessments. These are as follows.

Inventory Assessment for the Coastal Zone

Inventory Assessment for Regional Area

Inventory Assessment for the State (other than Coastal or Regional)

Inventory Assessment for the Nation

Environmental/Aesthetic Impact Assessment

Sociological Impact Assessment

Economic Impact Assessment

(Note the two previous categories may be treated as a single topic under socio-economic assessment)

Legal Assessment

These assessments will identify significant impacts and conflicts associated with the proposed use and will reflect expert information from professionals and value issues from the general public. As such, these assessments will contribute to and will be reflected in determining the acceptability decision. Based on the acceptability of the use as proposed by the applicant, the Council will render a decision as to whether the use will or will not be permitted in the coastal zone. The Council may decide that the use will be permitted but only if the applicant agrees

to specified modifications. As is shown in the Framework Analysis Chart, an alternate location for the use can be considered.

METHODOLOGY AND EVALUATION TECHNIQUES - DISCUSSION OF SPECIFICS

Methodologies to assist in preparing impact and evaluation statements (assessments) from which decisions can be made regarding the acceptability of a proposed activity vary from those which are relatively simple to those which are very complex.

The character and magnitude of proposed uses submitted to the Mississippi Marine Resources Council can be expected to vary from relatively small projects to relatively large, complex projects. In either situation the staff of the Mississippi Marine Resources Council must have a methodology by which the information provided by the applicant can be readily processed and, where necessary, must provide important additional information not provided by the applicant. Furthermore, the Mississippi Marine Resources Council must be able to identify additional practical and important information that is needed and may request this information from the applicant.

In the case of a large, proposed project that would have complex, multi-faceted environmental, socio-economic and legal considerations, the bulk of the information may be provided by the applicant. Much of this information may have been generated with many man-hours of effort and with complex, expensive hardware. This information as provided and additional information received as a result of reviews by government and other organizations, must be evaluated by the Mississippi Marine Resources staff. This will require the utilization of a methodology that is within the capability of the Mississippi Marine Resources Council.

In selecting a methodology applicable to evaluating and determining resource uses to be permitted in the coastal zone of Mississippi, one important criterium is that the time involved in implementing the methodology be within the practical time capability of the staff of the Mississippi Marine Resources Council. Also, the methodology must be within the physical capacity, e.g., hardware availability, of the agency.

Consequently, the methodology must consist of an approach that can be carried out on a simplified "paper-and-pencil" basis in a relatively short period.

On this basis, the methodology will largely consist of, but not be entirely limited to, the following techniques: 1. Essentially narrative 2. Check list, and 3. Simple matrices.

The check list technique is the simplest form of impact identification procedure. The checklist format will be a list of environmental, socio-economic, legal interactions and interrelationships that are specific to and associated with the proposed resource use. The checklist will serve as a means of focusing attention on conflicts and impacts to be considered and evaluated, especially those which may be classified as significant.

A simple matrix might be visualized as a two-dimensional checklist and is the first step toward defining interrelationships systematically. The matrix may be a "cause-effect" relation. When helpful, the applicable cells of the matrix will be scored on the basis of the magnitude of the impact upon a specific sector of the environment and on the degree of importance of the particular action on the environmental factor. A scale from 1 (minimum) to 10 (maximum) is used to estimate both the magnitude and importance of the impact.

For all practical purposes the magnitude can be understood as the probability of certain events to cause certain effects on a specific sector of the environment. Importance, on the other hand, refers to the actual degree of impact after the occurrence of that event has taken place. Each cell of the matrix is filled with two numbers reflecting the quantification of the criteria of the impact, namely magnitude and importance. The use of this ordered scaling procedure should at least provide for identification of the most significant impact effects (those with highest scaled values).

In summary, the Framework Analysis Chart, the three previously stated techniques, and additionally, professional judgement and intuitive reasoning will initially be used as the best available methodology for forecasting and predicting significant impacts for a proposed use. Along the use of analogous situations with adequate documentation of assumptions and supplemental field and/or laboratory investigations will be utilized in predicting impact relative to a proposed use.

METHODOLOGY AND EVALUATION TECHNIQUES -- GROUND WORK FOR AN IMPROVED METHODOLOGY

The previous section, as indicated, applies to the evaluation process as it will be initially conducted. The Mississippi Marine Resources Council staff will work within the scope as described in this section. However, as allowed by available staff time and/or research funds, improved methodologies will be investigated and utilized.

In the process of selecting a methodology for identification and prioritization of significant impacts and conflicts predicted for a proposed use in the coastal zone of Mississippi, the following criteria will be employed. The criteria are listed in general order of importance.

CRITERIA FOR SELECTION OF A METHODOLOGY

Comprehensiveness. The methodology must embrace all significant alternatives, all significant criteria and all major points of view. Without this criterion, decisions are almost certain to be suboptimal.

Workability. The methodology must be simple enough to be learned and carried out by a small staff on a small budget in a short time. Without this criterion, the Mississippi Marine Resources Council's mission would not be accomplished.

Portrayability. The methodology and the conclusions derived therefrom must lend themselves to compact summarization and high visual appeal so as to instill perspective, understanding and confidence in the public and earn their informed and enthusiastic participation. Without this criterion, the public would not understand or accept the results.

Expandability. The methodology must permit initial sweeping evaluation of broad alternatives and general criteria, and yet be readily expanded to provide a non-duplicative, increasingly detailed focus on key aspects. Thus, the same methodology should permit either a compact overview analysis or a detailed examination. Without this criterion, either (1) excessive effort would be expended initially pursuing aspects later found to be insignificant, or (2) an essentially new start and data foundation would have to be initiated midway in the study, or (3) a rare, extremely prescient individual would have to head and run the evaluation from its outset.

Explicitness of Criteria. The methodology must include an explicit portrayal of all relevant criteria, systematically arrayed and weighted to reflect the relative importance of each. Without this criterion, the validity of the

final results would be open to serious challenge. Such results might appear to be based largely on the personal concerns and perspectives of the analyst or upon current public whim.

Holism. The methodology must reflect an understanding of the environmental-socio-economic-legal system as a whole and the major interrelationships between the various criteria. Without this criterion, the interrelationship between criteria could be ignored.

Separation of Effects. The methodology must reflect the changes that would occur in moving from a "without the alternative" to a "with the alternative" future. Without this criterion, the alternatives could benefit or be penalized by now-versus-future changes it does not affect.

Commensurability. The various criteria are conventionally measured in a wide variety of objective and impressionistic units (dollars, biomass, recreation days, good-bad, jobs, etc.). Since there units of judgement are so widely disparate ("apples and oranges"), so-called conclusions are apt to become an unsynthesized basket of fruit, greatly paralyzing perception and decision making. Therefore, it would be highly desirable to employ a means of translating these ratings into commensurate units as a tool to facilitate comparison. Without this tool, the necessary synthesis of a wide variety of pros and cons is extremely difficult.

Other criteria to be considered will be ability to articulate (1) the timing, duration and a real spread of the impact, (2) uncertainty, (3) risk and (4) degrees of confidence in the evaluation.